1974-03

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THESIS

PROCUREMENT SUPPORT
AT THE
NAVAL WEAPONS CENTER CHINA LAKE, CALIFORNIA

by

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March 1974

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by

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Submitted in partial fulfillment of the
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MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
March 1974

ABSTRACT

Research and Development is a unique process which seeks to develop the necessary technological base in order to provide the Navy with high quality weaponry in a timely manner at reasonable cost. An integral part of this process is the system of Navy Laboratories which pursue knowledge in a three-dimensional matrix of technologies, platforms and warfare areas. The method which supports this effort in obtaining the assistance of commercial entities may be impeding the efficiency of Navy Laboratories by requiring centralized procurement support for low-dollar requirements while procurement personnel in the laboratories are underutilized.

This thesis examines the procurement support system for the Naval Weapons Center China Lake, California, which is the largest Navy Laboratory. The principal focus is on the procurement lead times and the degree of skill utilization as perceived by the personnel at NWC.

A new approach to granting purchase authority is proposed which would recognize the uniqueness of the Research and Development process and the need to enrich procurement jobs through judicious delegation of purchase authority and responsibility.

TABLE OF CONTENTS

LIST OF FIGURES

ABBREVIATIONS/TERMS

ASN(R&D)	Assistant Secretary of the Navy for Research and Development
AS_o	Assumed Similarity of Opposites
ASPA	Armed Services Procurement Act of 1947
ASPR	Armed Services Procurement Regulation
BUFFER	Person at NWC China Lake who is in a procurement position outside the Supply Department
BUY	To procure or purchase
BUYER	A purchasing agent or negotiator
CND	Chief of Naval Development
CNM	Chief of Naval Material
CNO	Chief of Naval Operations
CNR	Chief of Naval Research
CONTRACTING OFFICER	A person who has legal authority to act as an agent for the government in entering into contracts
D&F	Determination and Findings
DCNM(D)	Deputy Chief of Naval Material for Development
DDR&E	Director Defense Research and Engineering
DEPSECDEF	Deputy Secretary of Defense
DLP	Director of Laboratory Programs
DNL	Director of Navy Laboratories
DOD	Department of Defense
DSA	Defense Supply Agency
FMSAEG	Fleet Missile Systems Analysis and Evaluation Group

FPA	Flexible Purchase Authority
FSN	Federal Stock Number
GA	Group Atmosphere
GS	General Schedule (grade levels for civil service personnel)
ICP	Inventory Control Point
LPC	Least Preferred Co-Worker
MPC	Most Preferred Co-Worker
NADC	Naval Air Development Center, Warminster, Pennsylvania
NAVAIR	Naval Air Systems Command
NAVMAT	Naval Material Command
NAVSUP	Naval Supply Systems Command
NCEL	Naval Civil Engineering Laboratory, Port Heuneme, California
NCSL	Naval Coastal Systems Laboratory, Panama City, Florida
NELC	Naval Electronics Laboratory Center, San Diego, California
NMC	Naval Material Command
NOL	Naval Ordnance Laboratory White Oak, Silver Spring, Maryland
NPO	Navy Purchasing Office
NRL	Naval Research Laboratory, Washington, D.C.
NRPO	Navy Regional Procurement Office
NSRDC	Naval Ship Research and Development Center Bethesda, Maryland
NTDC	Naval Training Device Center, Orlando, Florida
NUC	Naval Undersea Center, San Diego, California
NULAPS	Navy Uniform Laboratory Procurement System

NUSC	Naval Underwater Systems Center, Newport, Rhode Island
NWC	Naval Weapons Center, China Lake, California
NWL	Naval Weapons Laboratory, Dahlgren, Virginia
ONR	Office of Naval Research
PR	Purchase Request
R&D	Research and Development
RACA	Requiring Activity Contract Administration
RDT&E	Research, Development, Test and Evaluation
RIMS	Request Information Management System
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
SYSCOMS	Systems Commands

I. INTRODUCTION

Laboratory procurement is intrinsically different from commodity procurement; it must be tailored in timeliness, personal expertise, and special provisions to the changing and peculiar requirements of creative and inventive performers. The strong need for laboratory management to be able to control the application of the procurement function to the mission has been in the forefront of many bitter debates in recent years. Administrative theorists are striving to achieve reductions in procurement manpower requirements and simultaneously upgrade the quality of procurements. This thesis considers one Navy laboratory, the Naval Weapons Center China Lake, California, as an example of the mismatch of user needs and producer support. It is the largest Navy laboratory in terms of total budget and manpower employed; yet it has only token in-house procurement support. An analysis of the various aspects of this method of support and recommendations to achieve a balanced but flexible system of procurement support is the paramount purpose of this thesis.

The secondary purpose of this thesis is to suggest a radical approach to Navy-wide laboratory procurement which focuses on the human asset as the principal decision variable.

Recent logistical considerations caused the Navy Regional Procurement Office, Los Angeles (NRPO-LA) to be relocated to the Naval Station Long Beach. In order to maintain clarity, NRPO-LA is used throughout this thesis and free substitution with NRPO-LB may be made without error.

The qualifications of the author to engage in an analysis of this category includes experience as: Director, Purchase Division, Naval

Training Center Supply Office, Great Lakes, Illinois; Labor Contract Administrator, Naval Supply Depot Guam, M.I.; Head, Special Contracts Section and Head, Contract Management Branch, Purchase Division, Ships Parts Control Center, Mechanicsburg, Pa. Applicable formal training in the procurement area includes: Defense Small Purchases; Defense Procurement Management Course; Defense Advanced Procurement Management Course; Contract Law; Contract Administration; and Cost & Price Analysis and Negotiation Techniques.

A. RESEARCH AND DEVELOPMENT (R&D)

During the earliest years of the United States' existence as an independent union the distrust of a strong central government acquired during the struggle for independence caused the Congress to adopt a hesitant view toward the granting of federal support for permanent scientific programs or agencies. Gradually this distrust waned and limited funds were provided to meet the nation's scientific needs.

One of the first large scientific programs was undertaken in 1803 when Congress authorized twenty-five hundred dollars for the Lewis and Clark Expedition.[1] Shortly thereafter Congress specifically directed that only military officers be employed in a coastal survey project. Since that time the armed services have been directly involved with scientific work. Research by the armed services not only serves a defense purpose; much of it has proven to be of great importance to those outside the military.

Mounting a mighty wartime R&D effort during the early stages of World War II with large central research laboratories established under government contracts at such places as Massachusetts Institute of Technology, California Institute of Technology, Harvard University, University of Illinois, Carnegie Institute of Technology, George Washington University and others would not have been possible without emergency legislation known as the First War Powers Act.[2] This was the first instance of Congress relaxing the normal peacetime procedures relating to

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[1] Lazure, Albert C. and Murphy, Andrew P., eds, Research and Development Procurement Law, p. 192, Federal Bar Association, 1957.

[2] First War Powers Act, December 18, 1941, C593, 55 Stat 838, 50 U.S. Code, App 601-616.

procurement. Almost all wartime military procurement was made under this emergency legislation and until enactment of the Armed Services Procurement Act of 1947 it provided the primary vehicle for awarding R&D contracts.[3]

The Armed Services Procurement Act of 1947 provided the continuing freedom from normal procurement practices in that negotiations with educational institutions were authorized and contracts for R&D were excluded from the rigid formal advertising requirements. The act was implemented by the Department of Defense by issuance of the Armed Services Procurement Regulation (ASPR) which was intended to set forth uniform policies and procedures in the procurement discipline.

Perhaps the most noticeable controversy concerning the interfacing of the R&D organizations and the procurement discipline was the uniqueness of the R&D efforts which many claim does not lend itself to "uniform procurement policies and procedures."[4] This difference of opinion has not just surfaced recently but was being expressed in the early nineteen hundreds. Although the R&D community has been successful in gaining certain advantages in the procurement arena the relative amount of money expended for hardware is so overwhelming that R&D has been forced into a secondary position. In 1973 defense and space-related programs received about 11 billion dollars while hardware expenditures were over 30 billion dollars. Furthermore, the numerous amendments to legislation in recent years has tended to restrict the R&D functions.[5]

The Department of Defense (DOD) manages its R&D efforts by centralizing control under the Director of Defense Research and Engineering (DDR&E).

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[3] Title 10 U. S. Code, C137.

[4] ASPR, paragraph 1-101, 1973.

[5] Lazure and Murphy, Research and Development Procurement Law, p. 213.

This organization follows a basic rule of management-by-exception in order to maintain flexibility.[6] Under this method of management, higher echelons only interject themselves into situations requiring support or corrective actions. In reality the top management of DDR&E restrict their direct involvement into cases of critical, controversial, high cost or severe troubles.

The role of DDR&E is to assist the Secretary of Defense (SECDEF) in effectively directing and controlling the overall DOD R&D program. Since most of the R&D work is carried out by the services SECDEF has delegated to the DDR&E the authority to "set policy; approve, modify or disapprove programs and projects of the services or other DOD agencies; enforce cooperation and coordination; and if necessary, originate program concepts."[7]

In 1966 the Navy reorganized its material support structure into six systems commands, all reporting to the Chief of Naval Material (CNM) who, in turn, reports to the Chief of Naval Operations (CNO). The systems commands, known as SYSCOMS, have the responsibility to conduct R&D except for exploratory development (which encompasses efforts directed toward solution of specific military problems short of major development projects) which remains under the control of CNM and is largely accomplished in-house at Navy laboratories. Figure 1 shows the organization chart for the Navy's R&D program. The principal organizations are CNM, Chief of Naval Development (CND), Chief of Naval Research (CNR) and the Director of Navy Laboratories (DNL).[8]

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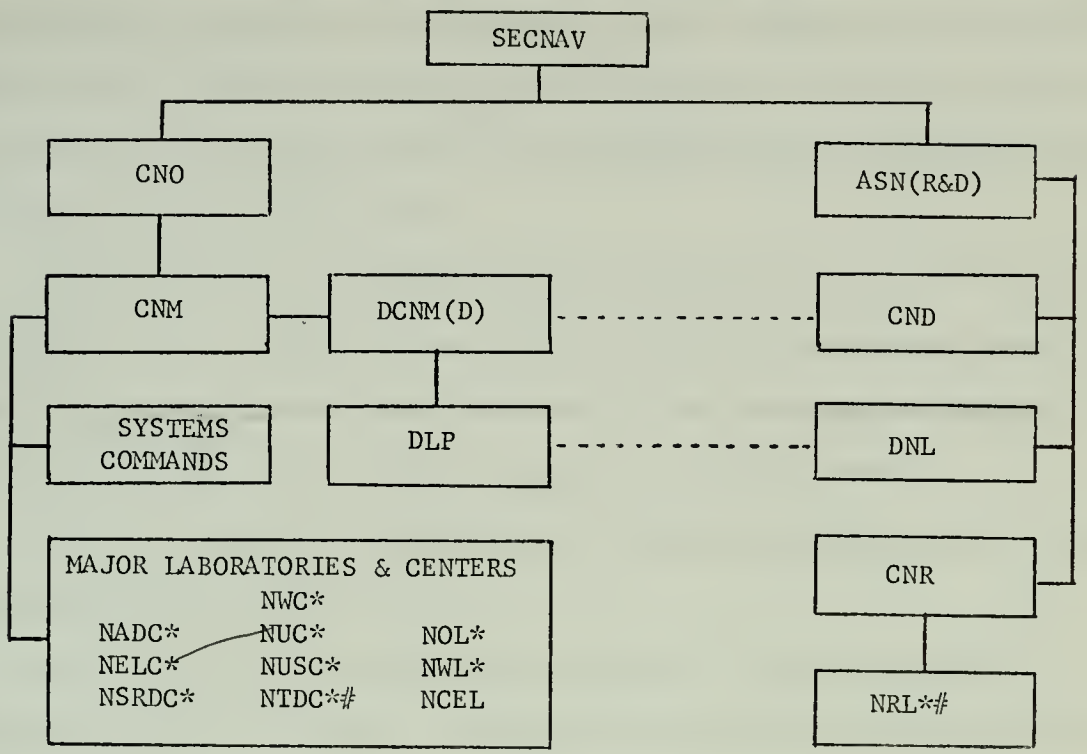
[6] Sanders, Ralph, ed., Defense Research and Development, p. 6, Industrial College of the Armed Forces, 1968.

[7] Ibid., p. 38.

[8] Department of the Navy, RDT&E Management Guide, July 1972.

FIGURE 1

Department of the Navy R&D Organization



PROCUREMENT STATISTICS FOR MAJOR LABORATORIES & CENTERS

Activity	Internal Actions	Internal Value	Total Actions	Total Value
NWC	60,120	$ 23,098,000	60,820	$ 93,098,000
NRL	42,632	36,632,000	42,632	36,632,000
NOL	31,067	36,655,000	31,067	36,655,000
NSRDC	27,503	12,116,000	27,503	12,116,000
NUSC	25,433	12,924,000	25,750	53,439,000
NUC	21,449	11,208,000	21,548	22,208,000
NADC	17,943	64,351,000	17,943	64,351,000
NWL	13,900	23,481,000	13,900	23,481,000
NTDC	425	105,552,000	425	105,552,000
TOTALS	217,582	$326,017,000	241,588	$447,532,000

*Indicates principal laboratories
#Not a CNM-Commanded Laboratory

CNM is responsible for developing most of the Navy's new ships, weapons and equipment. His general R&D functions include translating operational requirements into hardware systems, managing the technology base effort, defining capabilities made possible by advancing science and technology, developing detailed plans for RDT&E projects and overseeing implementation of these plans.

CND, who is also the Deputy Chief of Naval Material for Development (DCNM-D) plans, coordinates and directs the Navy's Exploratory Development Program for the Assistant Secretary of the Navy for R&D (ASN-R&D). This "double-hatting" is shown in Figure 1 by dotted lines.

CNR is responsible to ASN (R&D) for research, budgeting, accounting and related reporting services.

DNL, who is also the Director of Laboratory Programs (DLP) for DCNM(D) reports to ASN(R&D) to provide focus for matters relating to the health and development of all Navy Laboratories.

The principal laboratories, as indicated by an asterisk in Figure 1, collectively expend almost half-a-billion dollars through the procurement process each year. The lower section of Figure 1 provides a summary of procurement statistics for these laboratories during Fiscal Year 1973.

Since the reorganization in 1966 the value of a system of activities whose primary mission is R&D has been recognized. This system includes laboratories who are recognized experts in a three-dimensional matrix of technologies, platforms and warfare areas. NCEL, NELC, NOL and NUC are oriented along technology lines. NADC and NSRDC are platform oriented and NWL, NWC and NUSC are oriented toward surface, air and subsurface warfare respectively.[9]

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[9] Naval Material Command Instruction 5450.27, Subject: CNM-Commanded Laboratories and Centers; missions and functions of, 27 June 1972.

B. THE ROLE OF THE NAVAL WEAPONS CENTER CHINA LAKE, CALIFORNIA

In November 1943 the Secretary of the Navy (SECNAV) established the Naval Ordnance Test Station (NOTS) to provide adequate test facilities in which the California Institute of Technology could carry on its aircraft rocket development work for the Office of Scientific Research and Development. Located about 155 miles northeast of Los Angeles in Indian Valley in the northwest corner of California's Mojave Desert, it provided a setting that is ideally suited for year-round weapon development and testing.

Throughout the past thirty years the China Lake complex, designated the Naval Weapons Center (NWC), has provided some of this countries major weapons systems. Names like SIDEWINDER, ZUNI, ASROC, and SHRIKE have been NWC contributions of major importance. In fact, over seventy-five per cent of the airborne weaponry in use by the free world was developed at NWC.[10] Today the Center employs about 4,500 people at an annual budget of in excess of 180 million dollars.[11]

1. Mission of NWC

NWC's mission, simply stated, is to be the principal Navy R&D Center for air warfare and missile systems.[12] In support of this mission the major functions of the Center include: possessing the technical expertise required to carry out R&D in support of Navy and Marine Corps airborne warfare; fostering communications within the Navy R&D community

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[10] Naval Weapons Center China Lake, Information Guide, April 1971.

[11] Naval Weapons Center China Lake, Management Report, June 1972.

[12] Naval Weapons Center China Lake, Organization Manual, March 1973.

to keep abreast of related efforts in other laboratories; ensuring the compatibility of interrelated development programs; maintaining adequate capability in those areas of technology which contribute to the ability to develop airborne warfare, systems or subsystems; using the expertise available in other laboratories to avoid duplication; developing work assignments which clearly define the scope of the work to be performed and the estimated cost and time required; and allocating the necessary resources to fulfill its commitments.[13]

2. NWC Organization

The organization at NWC is built on three basic directorates reporting to the Technical Director who, in turn, report to the Center Commander. Figure 2 is a simplified organization chart showing the line authority down to the department level. It is important to point out that the Center Commander is a Naval Officer of Flag Rank and the Technical Director is a civilian appointed under Public Law 10-1581. It is interesting to note the participative nature of the top management of NWC which is comprised of the Center Commander, Technical Director and Deputy Commander. These individuals are responsible for overall mission authority and technical aspects of the mission and administration of the Center, respectively.

The participative nature of this management team can be best appreciated by referring to the Center Operating Principles, approved jointly in 1971 by CNM, DNL, the Center Commander and the Technical

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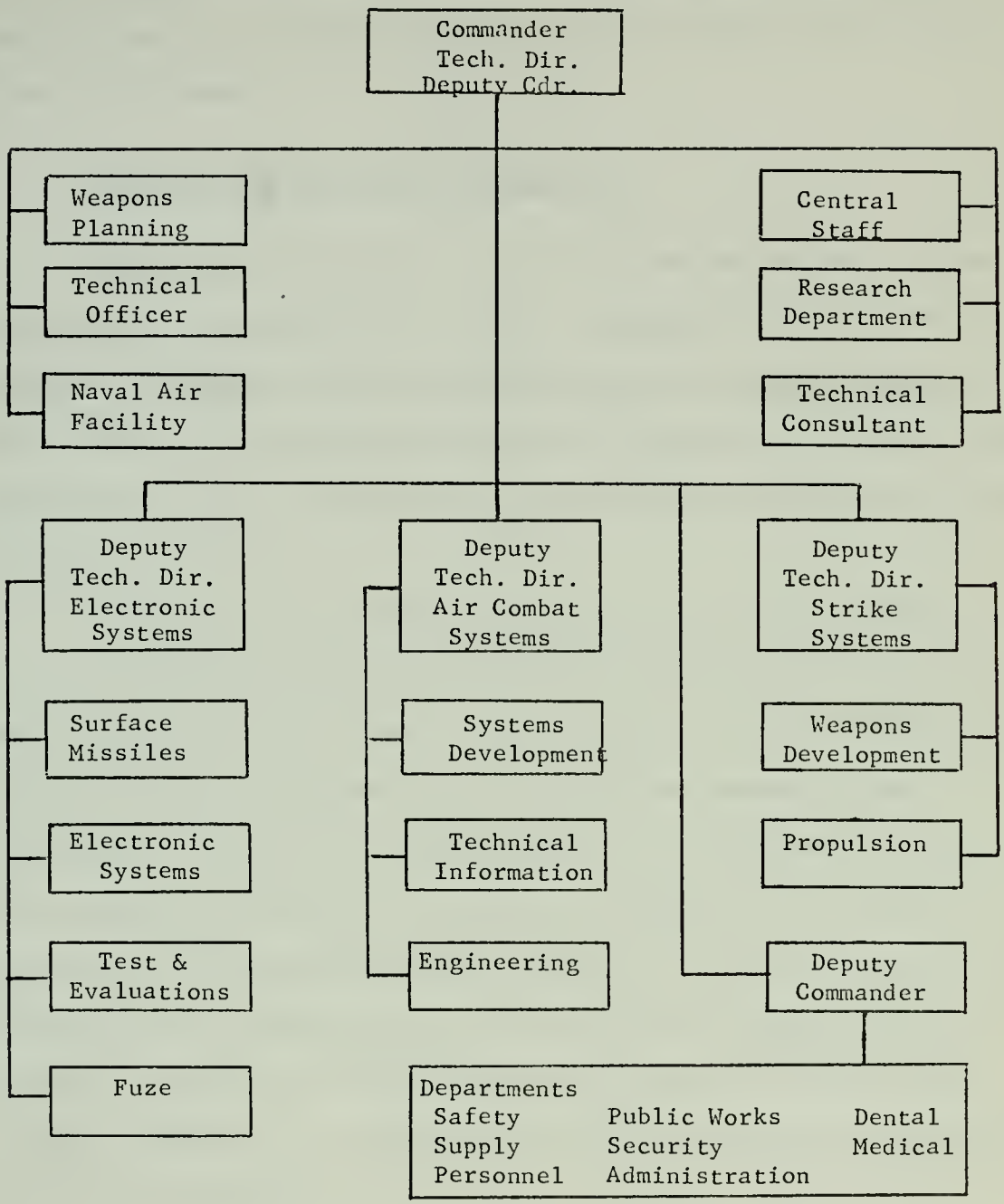
[13] Naval Material Command Instruction 5450.27, Subject: CNM-Commanded Laboratories and Centers; Missions and functions of, 27 June 1972.

FIGURE 2

Naval Weapons Center China Lake Organization Chart



Director (CNM and DNL are military and civilian respectively). Appendix A is a reproduction of these principles with appropriate highlighting to show the degree of civilian-military balance of control over the operations of the center.

3. NWC Procurement Policy and Procedures

During Fiscal Year 1973 almost 80 million dollars was expended through the procurement process by NWC. Within NWC this process is the principal responsibility of the Supply Department. Figure 3 shows the organization of the Supply Department down through the Branch Level. The procurement process is accomplished by both internal and external (to NWC) resources.

Internally, NWC processes all requirements having a value of less than $2,500 using the Simplified Purchase Procedures authorized by ASPR paragraphs 3-203 and 3-600. These procedures provide for a minimum of administrative burden and delay in placing procurements of small dollar value. The Center is authorized to award firm-fixed price contracts not exceeding $25,000 and is designated a Non-Centralized Buying Activity by the Naval Supply Systems Command (NAVSUP).[14] In certain cases NWC will place bilateral contracts up to a value of $10,000 using the emergency procedures contained in the Field Purchasing Manual.[15] Use of these emergency conditions are decided on a case-by-case basis by the Director of the Supply Department.

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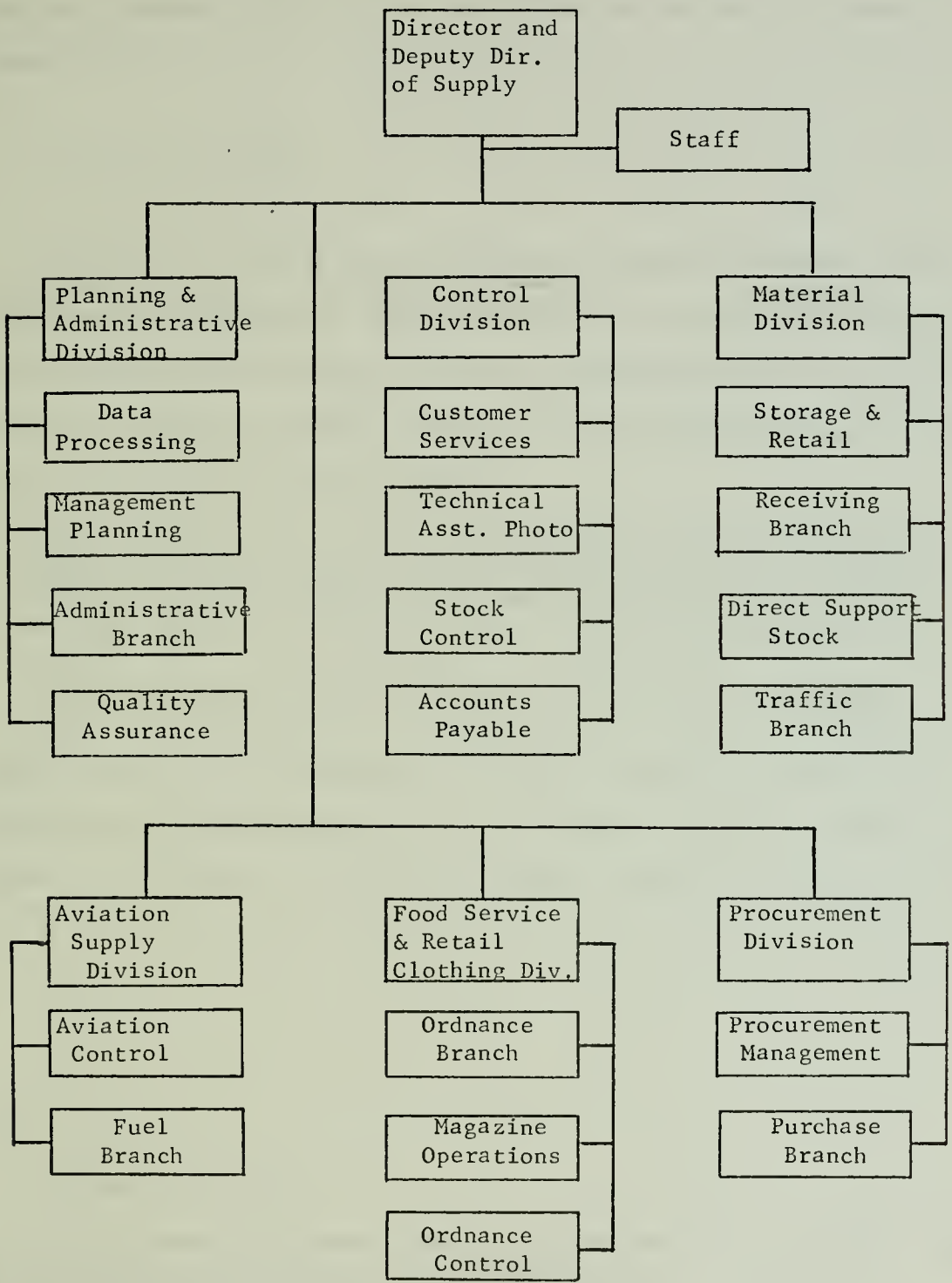
[14] Naval Supply Systems Command, Field Purchasing Manual, para. 1030.

[15] Ibid., para. 4043.

FIGURE 3

Naval Weapons Center China Lake Supply Department Organization Chart



Since NWC does not exercise the maximum authority granted by NAVSUP virtually all requirements in excess of $2,500 are forwarded to the Navy Regional Procurement Office in Los Angeles (NRPO-LA) which is classified as a Central Buying Activity by NAVSUP with unlimited purchase authority.[16]

C. THE CALL FOR CHANGE

In July 1971 the Task Group on Defense In-House Laboratories, which was formed by DEPSECDEF and DDR&E, released its report which noted that In-House Laboratories should be centers of excellence with more authority delegated commensurate with assigned missions and responsibilities. Moreover, the Task Group concluded that:

> "support activities must assist rather than control line laboratory managers in their missions. Often staff agencies with no direct responsibility for mission accomplishment or funds make decisions that may drastically limit the authority of the laboratories to act."[17]

The Task Group recommended that laboratory directors be given greater control over procurements with higher monetary thresholds and streamlined procurement procedures. Once again the call for change in regard to limitations on the R&D procurement process had been voiced.

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[16] Ibid., para. 1028.

[17] Task Group on Defense In-House Laboratories report, Subject: Report of the Task Group on Defense In-House Laboratories, 1 July 1971.

II. PROBLEM STATEMENT

In focusing attention on the major problems in procurement support for NWC the system was observed from the customers point of view. This approach provided a bias in favor of the ultimate user of procurement services; however, this is the intent of this thesis--to see the system as the customer sees it and determine if improvements can be made.

A. THE HISTORY OF PROCUREMENT SUPPORT AT NWC CHINA LAKE

During Fiscal Year 1970 (the time the Task Group on In-House Laboratories was concluding its study) a major shift in procurement effort was undertaken at NWC China Lake. This shift was initiated in an attempt to reduce the cost of receiving procurement support from four separate locations.

Internally about forty per cent of all procurements under $2,500 were processed by six people located at China Lake. In Fiscal Year 1970 almost 18,000 actions were processed by this group. The remaining sixty per cent of transactions under $2,500 were processed at the Naval Undersea Research and Development Center, Pasadena (NUC) using an intra-service support agreement. In addition, NUC processed all transactions between $2,500 and $25,000 under a procedure established when NWC and NUC were formed from the three locations of the old Naval Ordnance Test Station. The actions in excess of $25,000 were forwarded to NRPO-LA. The fourth procurement location was the Corona Annex of NWC which had a small purchase branch to provide procurement support for the Fleet Missile Systems Analysis and Evaluation Group (FMSAEG).

On 31 December 1970 the decision to change the method of procurement support at NWC was implemented. NWC established a capability at China Lake to process small purchases (up to $2,500) and shifted the requirements in the $2,500 to $25,000 range to NRPO-LA. One of the primary objectives for this shift in processing locations was a potential cost savings of about $400,000 per year. Appendix B contains the justification for these changes including the estimation of annual savings.

B. THE FLOW OF PROCUREMENT ACTIONS

In late 1972 a special study was conducted by NWC which attempted to isolate and identify all processing and decision points for procurements under $100,000.[18] This study concluded that there is no single flow chart for a given type of procurement; it depends on the department of origin and sometimes on the division, branch or project. Moreover, this situation is aggravated by the fact that "no two technical departments originating requisitions handle their internal processing in the same way."[19] Within some departments, the report says, there is not necessarily uniformity in procedures.

Figure 4 is a typical flow chart for a requisition at NWC. It is extremely general until the requisition arrives at the NWC Supply Department where processing is somewhat uniform.

Initially the requesting department identifies a particular need. This need may be in the form of an idea for research which must be

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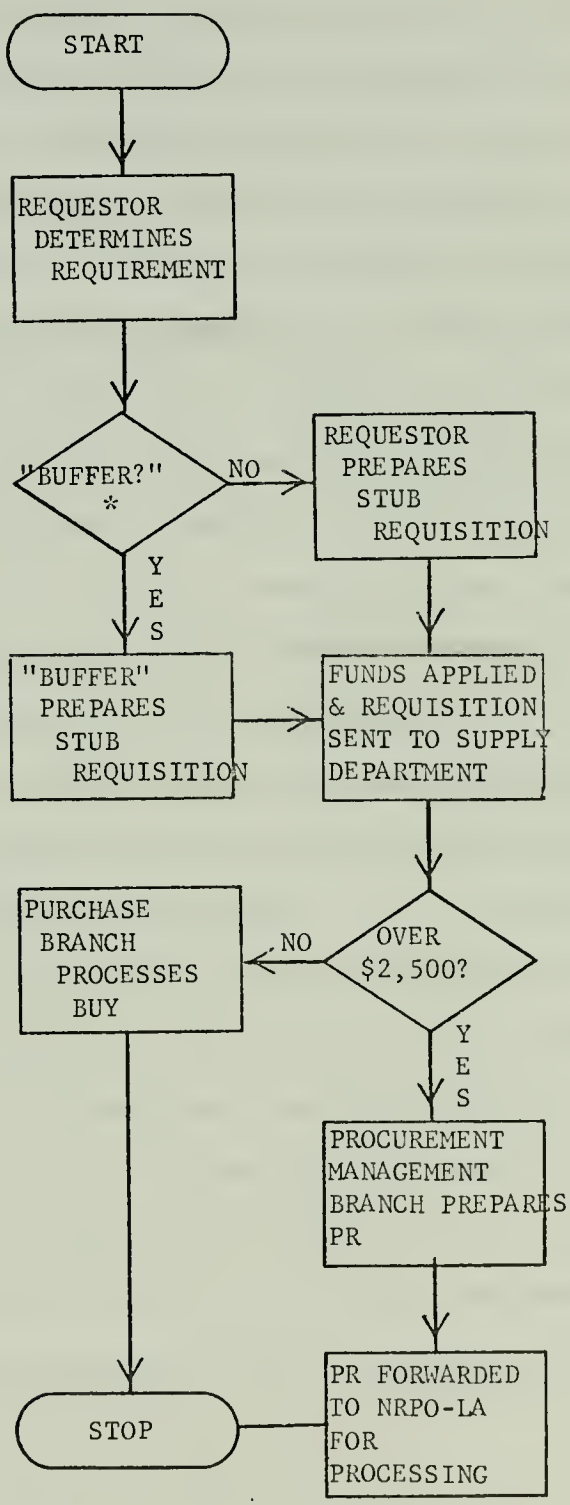
[18] Naval Weapons Center Memorandum Code 042, Subject: Procurement Process Flow Charts, 12 December 1972.

[19] Ibid.

FIGURE 4

Flow of Procurement Requirements at NWC



* A "buffer" is a person at NWC who is in a procurement position outside the Supply Department.

translated into data by a level-of-effort by a contractor or a requirement for hardware which may be manufactured to meet specifications. Once a need is identified the user will attempt to describe this need in the form of specifications. Numerous questions are presented during this process, many of which impinge directly on the procurement system. Depending on experience and competing demands on his time, the requestor will consider, among other things, if the item is classified, whether or not there is an off-the-shelf item that will satisfy the requirement, how much data will be required from the contractor, available sources, preferred sources, foreign sources, availability of drawings, producibility of specifications adequate for competition, existence of special funding constraints, schedule requirements, need for government control over the contractor, preferred type of contract, need for samples, need for interfacing with the Supply Department or NRPO-LA, existence of a project manager with a vested interest in the requirement, etc.

After the considerations such as described above are made the procurement has taken on an individual personality with varying levels of complexity which the requestor will translate into a stub requisition complete with specifications, drawings, data requirements, special justifications, schedule requirement, estimated cost and appropriate financial information to permit proper committment against the legal appropriation.

Once the requirement has been documented it is termed a stub requisition with necessary approvals and funding citation which is either handed or sent via local mail channels to the Supply Department. The manpower devoted to the preparation of stub requisitions which will

result in procurement actions of less than $100,000 has been estimated at 13.3 manyears.[20]

Upon receiving the stub requisition the Supply Department screens it to determine if the item is in the supply system, whether a substitute exists, if proper approvals have been obtained, whether it can be processed locally or must be sent off the Center, if necessary justifications (such as sole source, rapid response, etc.) are contained, if there are special contractual documentation or provisions required and if approval of higher authority (than NRPO-LA) is required the proper documentation required by regulations must be attached.

Four courses of action are normally possible during Supply Department processing: the item has a Federal Stock Number (FSN) and is requisitionable through the supply system; the item does not have a FSN or is not requisitionable through the supply system and is stocked locally; or the item can be procured either locally or through NRPO-LA. In the last case a Purchase Request (PR) is prepared by personnel from the Procurement Management Branch of the Supply Department for submission to NRPO-LA. An example of a PR may be found in Appendix C.

Procurements sent to NRPO-LA enter the formal realm of procurement and cannot easily be charted because they must comply with a variety of procedures and procurement related statutes. One estimate is that some 4000 statutes impact on the procurement process.[21] NRPO-LA does have a guide which gives a general idea of the steps which could be involved in

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[20] Naval Weapons Center China Lake Memorandum Code 25; Subject: Report on NWC Procurement Process; comments on, 17 January 1973.

[21] U. S. Government Printing Office, Report of The Commission on Government Procurement, Volume 4, Part J., December 1972.

completing a formal procurement (as opposed to procurements processed under Simplified Purchase Procedures). Appendix D contains a copy (reformed for this thesis) of this guide. It is significant to note that the timeframes are not statistically meaningful nor is the guide intended to be all-inclusive.

C. STAFFING

The flow of procurements, which has been previously discussed, is the responsibility of personnel in both the technical departments and the Supply Department of NWC. One of the significant areas of controversy at NWC in recent months is the proliferation of personnel in the procurement pipeline.

1. Staffing for Procurement Support Within the NWC Supply Department

The Procurement Division is the organizational entity responsible for procurement matters at NWC. This division has two branches employing 37 civil service personnel and is responsible for providing advisory services on contract principles and practices, participating in procurement pre-planning phases of major projects, providing advice coincident to the preparation of PR's, providing policy guidance for performance of contract administration of contracts assigned to NWC by the contracting officer and purchasing material for stock and direct turnover by use of Simplified Purchase Procedures.[22]

The execution of these tasks is accomplished by personnel of the Procurement Management Branch and the Purchase Branch. These branches

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[22] Naval Weapons Center China Lake, Organization Manual, March 1973.

devote virtually all of their manpower to supporting the requestors in the areas noted above. Appendix E contains a grade structure and salary schedule for the Procurement Division and it is important to note that the present level of support costs NWC almost a half-million dollars per year.

All of the functions described above, except for purchasing material, are the prime responsibility of the Procurement Management Branch plus clerical support from the Procurement Division staff; thus a total of 10 persons are devoted full time to functions which do not directly result in procurement. Conversely the 25 people assigned to the Purchase Branch devote almost all of their efforts to direct procurement of supplies and services under the locally imposed dollar limitations previously discussed.

2. Staffing for Procurement Support Outside the NWC Supply Department

Within almost every department of NWC there are personnel who must take the requirements of an engineer/scientist and translate them into language understandable to the procurement people. The study, which was referenced in the first paragraph of section IIB, estimated that some 13.3 manyears of effort were devoted to this function. As in the case of the documented paper flow there is no general rule of organization to provide this service to the department; hence each is unique. According to the study these departmental procurement personnel, often referred to as "buffers", provide the requestor with advice concerning the procurement process, develop purchase descriptions for stub requisitions, determine special contract provisions which will be needed, assist in proposal evaluation, assist in contract work assignments, expedite processing of

procurements through the procurement pipeline, assist in resolving contract administration problems and keeps the department director informed concerning status on critical or overdue procurements. The time expended by each department varies as the particular director perceives his need for a procurement staff.

NRPO-LA is a NAVSUP activity providing area buying support for naval activities in the Eleventh Naval District. Currently there are approximately 100 people employed at NRPO-LA. These personnel are organized into two contracting branches, the Special Contracts Branch and the General Contracts Branch, plus a substantial network of support areas such as legal, clerical, contractor performance, small business specialists and management.

NWC's procurements are segregated by the complexity of the procurement with the more complex R&D procurements being assigned to the Special Contracts Branch and the remainder to the General Contracts Branch.

D. WORKLOAD OF PROCUREMENT ACTIONS AT NWC CHINA LAKE

The procurement workload at NWC for the Fiscal Year ended 30 June 1973 was 63,857 actions totaling $76,513,218 which includes both the actions processed by NWC and NRPO-LA.[23] Internally NWC processed 62,759 actions valued at $20,825,000 which is over 98 per cent of the actions but only slightly more than 27 per cent of the dollars expended through the procurement process. Only 81 actions valued at $457,000 were processed

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[23] Naval Weapons Center China Lake Report 4295, Subject: Purchase Statistics, 12 July 1973 and Telephone Conversation with the Technical Assistant to the Officer-in-Charge of NRPO-LA, 14 February 1974.

in the $2,500 to $10,000 emergency category. NWC did not process any procurements over $10,000.

NRPO-LA processed 1,098 actions (contracts plus modifications) valued at $55,688,218 for NWC China Lake during Fiscal Year 1973. The total workload at NRPO-LA for that Fiscal Year was 3,662 actions valued at $209,857,486 which makes it the fourth largest NAVSUP Field Purchasing Activity in terms of dollar volume.[24]

NWC is estimating a similar volume of actions and dollar value for the Fiscal Year ending 30 June 1974; thus the inflationary pressures experienced in recent months are certain to result in a greater number of actions migrating to NRPO-LA in light of the $2,500 threshold.

E. THE PROBLEM AND ATTEMPTS AT SOLUTIONS

The problem in regard to procurement support at NWC China Lake is simply to determine whether or not the present procurement policies and procedures are providing the maximum support to the highly qualified cadre of scientists and engineers engaged in the R&D effort. Numerous prior reviews have been made by both military and civilian personnel. Several good recommendations have become the subject of bitter in-fighting at higher echelons (than NWC) resulting in a frustrating lack of attention to the underlying problem: what is the best method for procurement support of a Navy Laboratory?

In late 1971 NWC proposed to NRPO-LA a plan for the establishment of a Branch of NRPO-LA located at NWC. This proposal has been reviewed and revised on several occassions with little, if any, success toward

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[24] Ibid.

implementation. Essentially the plan provides for the administrative transfer of functions and personnel from the Procurement Management Branch to NRPO-LA. This would give NWC a local organization representing the Contracting Officer at NRPO-LA. In addition, it would permit the removal of an intermediate step in the procurement chain by facilitating direct requestor-NRPO-LA dialogue during all phases of a procurement without traveling over three hundred miles.

Therefore, the problem involves the evaluation of the present policies in regard to providing maximum service for the workload and effective utilization of staffing at both NWC and NRPO-LA. The remainder of this thesis focuses directly on these areas.

III. RESEARCH PROCEDURES

Since the question of procurement support for NWC has immediate or practical value applied research, as opposed to pure research, was conducted. This research was centered around on-site discussions at NAVMAT, NAVSUP, NAVAIR, NOL, NWL, NRPO OAKLAND, NRPO-LA and NWC. The NAVMAT Laboratories Logistics Conference hosted by NWC in late 1973 provided a concentrated period of exposure to representatives from NAVMAT, CNR, DSA, NRPO-LA, NRL, NUC, NELC, NOL, NSRDC, NADC, NCEL, NWL and NCSL. In addition, considerable documentary research was performed to determine if past studies have reached conclusions and made recommendations in regard to laboratory procurement and whether or not any action has been taken on those conclusions/recommendations. Particular attention was devoted to obtaining policy statements from high officials of the Navy, both military and civilian, concerning laboratory procurement. The analysis in this thesis relies heavily on the opinions of people involved in all phases of the R&D process.

A. INTERVIEWS

Five of the six Directors of the Technical Departments at NWC were interviewed to determine their perceptions of procurement support as it should be and as it presently exists. Each was asked to describe the procurement support system in his department with particular attention on the reasons for employment of persons considered/classified as a procurement specialists/assistants. In those departments with procurement

oriented personnel assigned these individuals were interviewed to gain information about the daily operations of their positions.

Two very significant interviews were conducted with the two most recent Technical Directors of NWC. One of these gentlemen retired in May 1973 and the other selected for the position of Assistant Secretary of the Air Force for Research and Development. Both of these gentlemen were invaluable in setting the tone of overall operation of the largest Navy laboratory in the present environment.

Interviews were conducted with personnel of the NWC Supply Department including all those in managerial positions from first level supervisors up to the Director. In addition, all individuals in grades GS-9 and above were interviewed. Limited contact was made with lower graded procurement personnel from the Purchase Branch; however, sufficient information was obtained from the more qualified buyers in grades 4, 5, 6 and 7 to form certain conclusions about their desires and frustrations. The primary intent of these interviews was to determine the perceptions of the people directly involved in NWC's procurement flow concerning the system and how it should be, procurement experience, daily work effort, skill utilization, major problems and the degree of interface with the technical departments.

The NAVMAT Laboratory Logistics Conference, previously discussed, provided a wealth of information from the various Supply Officers and/or Procurement Managers of all the Navy Laboratories. These individuals were queried concerning their respective procurement support systems with prime emphasis on the degree of technical/procurement interface.

Key military and civilian personnel in procurement policy positions in NAVMAT and NAVSUP were interviewed to gain an appreciation of the view

from the headquarters concerning the procurement support system for Navy Laboratories.

Several interviews were conducted with top management of NRPO-LA to determine the philosophy of laboratory procurement support seen from the perspective of the R&D procurement activity.

B. THE WORKLOAD SAMPLING PLAN

Information obtained during the interviews with technical and procurement personnel from NWC strongly suggested that the major problems in procurement support lay squarely on those procurements which must be forwarded to NRPO-LA and do not have sufficient visibility from external sources, such as project managers or interested flag officers, to insure responsive support. Accordingly, records covering all the PR's sent external to NWC during Fiscal Year 1973 were sampled on a random basis. The population of PR's totaled 633 of which 100 were selected for study.

Since PR's represent primarily discrete events, and they are assumed to be independent, the Student's-t Distribution was used for probabilistic calculations. This distribution was chosen because the universe of PR's was assumed to be normally distributed with mean and variance unknown.[25]

In addition a 100 per cent sampling of PR's submitted by NWC to NRPO-LA during four consecutive weeks was made to test an algorithm developed for this thesis. The algorithm (see Appendix F) was devised to determine the relative level of difficulty of procurements being sent external to NWC. The results of this test are intended to form a basis

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[25] Larson, Harold J., Introduction to Probability Theory and Statistical Inference, p. 241, Wiley, 1969.

for an opinion concerning whether or not a significant number of PR's now being sent to NRPO-LA could be retained at NWC for processing.

C. PROCUREMENT PERSONNEL QUESTIONNAIRE

In order to examine the feelings of NWC procurement personnel a simple questionnaire (see Appendix G) was manually distributed to all except non-procurement persons in the Procurement Division. This questionnaire used Fiedler's Least Preferred Coworker (LPC) and Group Atmosphere (GA) Scores and Sample Scales.[26] The intent of this questionnaire was to determine if the procurement personnel are task-oriented or person-oriented. In addition, the questionnaire included a short portion of questions/statements concerning how the individual felt about ten factors of employment. These factors were extracted from Herzberg's Hygiene-Motivation Theory.[27] Firm conclusions were not sought using Herzberg's techniques due to the lack of empirical support for their reliability; hence only indications for possible consideration were desired.[28]

D. DOCUMENTARY RESEARCH

During the on-site visits to various laboratories and the headquarters activities, extensive documentary research was conducted. In particular,

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[26] Fiedler, Fred E., A Theory of Leadership Effectiveness, p. 38-60, McGraw-Hill, 1967.

[27] Herzberg, Frederick, "One more time: How do you motivate employees?" Harvard Business Review, v46, Nr 1, p. 53-62, January-February 1968.

[28] Chalupsky, Raymond J., Beyond the Confines, a paper submitted in partial fulfillment of the requirements of SM 3304, Naval Postgraduate School, 1972.

the supporting files for the Naval District Washington Procurement Consolidation Study conducted in late 1971 were searched for policy statements that indicate the approach Navy Laboratories should be taking from a system standpoint.

IV. DATA PRESENTATION AND INTERPRETATION

It is important to restate that the analysis of the data presented in this section relies heavily on the opinions of people involved in all phases of the R&D process, particularly the procurement area.

During the interviews it became apparant that two schools of thought, tending toward the parochial, existed in relation to laboratory procurement. In the staff/headquarters and centralized procurement activities, the feeling was one of protecting the system as it now exists by maintaining and strengthening the centralized procurement concept. On the other extreme the staunch laboratory supporters demand total control over the procurement function. There are no known statistics or facts that would support either extreme to the satisfaction of the holder of the opposite view. Occasionally someone would privately admit that there must be a compromise system that would placate both the groups.

A. CUSTOMER DESIRES

Interviews with the two former Technical Directors resulted in both advocating a change in the present method of procurement support for NWC. They based this on the need for closer technical-procurement interfacing than currently possible with a physical separation of over 100 miles. In their view, there are numerous procurements which are simple requirements for a piece of equipment made by only one manufacturer and it should be within the capability of NWC to provide this type of routine support. In the true R&D area there is probably ample reason for having a centralized

group of experts in R&D procurements. Both gentlemen agreed that it should not be any more difficult to hire procurement personnel than engineers or technicians.

Five of the Directors of the Technical Department were interviewed to determine the working level philosophy of procurement support at NWC. All five stated that procurement filled a significant role in their departmental operations. Moreover, all agreed that external pressures from project managers, systems commands, etc., do effect the way they must do business. Often their ability to rapidly place contracts is taken into consideration by some of these external sources before projects are assigned to NWC. In this regard, they (NWC) must be competitive in obtaining projects from external sources since this provides an influx of money which, in turn, pays peoples salaries.

Four of the five director's interviewed said they take a daily interest in the procurement process as it affects their departments. A similar number were of the opinion that technological advancement must, at times, override cost considerations.

Three of the five stated they felt that scientists/engineers should not develop procurement specifications. They felt that the procurement package, including appropriate specifications, should be developed by specialists in the procurement field using the raw input from the scientist/engineer. Through intensive interfacing these two disciplines can formulate a complete procurement package without hindering the technical effort in administrative red tape.

Three of the five indicated they felt NRPO-LA does consult with the requiring technical department on technical decisions. However, they were quick to add that they all had procurement liaison personnel in their

respective departments who maintain close contact with NRPO-LA and are able to monitor the pulse of individual procurement actions.

Similarily, three of the five said that status on procurements sent outside NWC, primarily to NRPO-LA, was extremely sparse unless the requiring department aggressively monitored the procurement. This, they agreed, was the single most important reason for the existence of personnel in their departments who were considered procurement oriented.

Procurement personnel in the requesting departments, often referred to as"buffers", were extensively queried concerning the timeliness of status and the degree of consultation by NRPO-LA on technical problems. They all agreed that status on procurements being processed by NRPO-LA was unsatisfactory. They felt that the existence of procurement personnel in the supply department was unnecessary because they ("buffers") were physically close to the requiring departments and therefore had a better appreciation of actual requirements.

One individual felt that the process was so fragmented that each segment was almost sterile. He saw no solutions unless the interface between the procurement and technical personnel was made extremely active. This he, and others as well, felt could only be aided by physically locating the procurement personnel in the departments they are supposed to serve.

B. SUPPLY DEPARTMENT PROCUREMENT PERSONNEL

The Supply Officer responds to questions on contractual problems at least twice weekly. These are posed by various department directors, primarily technical. He feels that he is merely a conduit on those procurements which do not fall within his guidelines for local procurement.

Therefore, he strongly supports the establishment of a Branch of NRPO-LA at NWC so these questions can flow between technical and procurement personnel without being passed through a third party. Moreover, this would provide the technical department with on-site contact with NRPO-LA thereby reducing the travel expenditure between China Lake and Los Angeles.

Since NWC does not use the full purchase authority granted the question was posed for the reasons underlying this truncated approach to procurement support. Several reasons were offered among which were lack of proper personnel in both quantity and proficiency, the impact on the workload at NRPO-LA, reluctance to increase overhead costs and the belief that the problem with the procurement support at NWC is not a procurement problem but a management problem.

1. Desires of the NWC Supply Department Procurement Personnel

The Procurement Management Branch has five GS-12 contract administrators, two GS-11 contract specialists and one GS-9 contract administrator. During interviews with personnel from this Branch, it was learned that each department at NWC is assigned an individual in the Procurement Management Branch for procurement liaison purposes. All eight of the persons assigned to this branch agreed that these assignments were constantly changing. This was evidenced by an assignment memorandum which was less than three weeks old yet was already invalid due to assignment changes.[29]

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[29] Naval Weapons Center Supply Department Memorandum 2521/JJW:ph, Subject: Supply Department Procurement Management and Customer Service Branches; information concerning, 27 August 1973.

Only two people in the Procurement Management Branch had actual buying experience with designation as a contracting officer for the government. These individuals said they felt somewhat restricted in the performance of their duties because they could not participate directly in the award of contracts.

The post-award function, referred to as RACA functions, was the subject of several interview sessions. All but one of the persons in the Procurement Management Branch agreed that RACA functions were absorbing about 50 per cent of their time and the trend appeared to be in the direction of a greater concentration in this area. While this trend is providing more direct involvement with the contractor and the requiring department, the increase in the amount of paperwork was reducing them to clerical workers.

Only three of the eight experience greater than ten per cent face-to-face contact with technical department personnel, some of whom were "buffers".

Five of the eight said the utilization of at least $10,000 of existing purchase authority would definitely help in alleviating problems associated with forwarding procurements to NRPO-LA. Those who did not feel this to be an important point had few, if any, actions under $10,000 to process.

In searching the degree of communication between the technical departments and the procurement personnel the question of prior knowledge of requirements before the stub requisition is submitted was raised. All stated that they generally do not know of a procurement requirement until the stub requisition reaches their desk for PR preparation.

In the area of status on outstanding PR's there was a divergence of systems; three of the eight used a passive (management by exception)

method and five used a tailored system which looks at each PR and some sort of tickler is made for appropriate follow-up action. This tailored approach is each individuals best attempt to keep himself informed and avoid long periods of inactivity by NRPO-LA. Little of the information is passed back to the requesting department unless they ask for it or conditions exist which cause a considerable amount of attention to be focused on the particular PR. One of the principal concerns of NWC procurement personnel is the need to constantly contact the buyer at NRPO-LA in order to obtain status on outstanding PR's. They feel that an active status system which would provide regular status on outstanding PR's would be extremely beneficial.

In the Purchase Branch (for staffing information see Appendix E), where the only actual buying occurs, the problems/advantages inherent in using the full purchase authority were sought. The Branch Head was queried and he responded by attempting to relay some of the frustrations of his better performers who cannot be responsible for procurements over $2,500 unless it is a special case approved by the Supply Officer. Those who have processed the few procurements between $2,500 and $10,000 have expressed a great deal of satisfaction. Upon further inquiry it was learned that only two individuals were designated as contracting/ordering officers. In view of the number of purchase orders issued in Fiscal Year 1973 (12,273) this represents a tremendous load on the individuals who are presently privileged to sign orders on behalf of the government.

Three individuals who were engaged in small purchases were interviewed in grades 6 and 7 to determine their feelings concerning procurement support. They all felt that they should be able to do more for their customers. They were of the opinion that escalation of prices coupled with the locally imposed purchase limitation of $2,500 causes the requesting

departments to break down their requirements to keep them under $2,500. Moreover, they felt that they are experienced enough to handle purchases of larger quantities of the same material that they are now buying.

2. Motivation of the NWC Supply Department Procurement Personnel

Twenty-four questionnaires were distributed of which fourteen (58 per cent) were returned completed, two blank, and the remaining eight were not returned. Appendix H is a tabulation of the responses to each factor in the questionnaire. Appendix I was constructed using Fiedler's Scale Guide and shows the Mean LPC ($\overline{X}$) is 4.67 which Fiedler says is high.[30] A high LPC individual distinguishes between the person and the way he works and derives his major satisfaction from successful interpersonal relationships.

The Assumed Similarity of Opposites (AS_o) is low, as indicated by the relatively large D of 16.1 (see Appendix I) and indicates how the individual perceives his Most Preferred Coworker (MPC) and LPC; hence he sees them as dissimilar.[31]

The Group Atmosphere portion of the questionnaire revealed that the Mean Group Atmosphere ($\overline{GA}$) is 5.89 which is indicative of a high degree of cohesiveness.

An analysis of the replies to the Herzberg Hygiene-Motivator factors shows that certain problems may exist which management can concentrate on to improve performance. Figure 5 shows there were at least three significant indications of dissatisfaction in the Hygiene

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[30] Fiedler, Fred E., A Theory of Leadership Effectiveness, p. 38-60, McGraw-Hill, 1967.

[31] Ibid.

FIGURE 5

Herzberg's Hygiene-Motivator Replies

Factor	Feelings	
	Good	Bad
Hygiene:		
NWC Policy & Administration	8	6
Relationships with Others	13	1
Salary	11	3
Supervisor	9	5
Working Conditions	9	5
Motivators:		
Achievement	12	2
Advancement	7	7
Recognition	6	8
Responsibility	11	3
Work Itself	13	1

factors. Specifically, a substantial number of respondents said they had bad feelings about Working Conditions, NWC Policy and Administration and Supervision. While these areas do not, in Herzberg's opinion, contribute to motivation they do remove areas of irritation.

Two areas where motivation could, according to the responses, be improved are Recognition and Advancement. At least half of the respondents stated they had bad feelings about these two factors.

In summary, the questionnaire revealed that the personnel engaged in the procurement function at NWC are person-oriented, fairly well motivated and belong to a cohesive group. These indications provide a basis for certain conclusions which will be discussed in a later section.

C. INFORMATION FROM SOURCES OUTSIDE NWC CHINA LAKE

Virtually all the individuals who were contacted outside NWC could be neatly categorized by their position or parent command. Those connected with laboratories (other than NWC) felt strongly that laboratory procurement should be performed wholly at the laboratory and not centralized at some detached, and often disinterested, activity. The principal reason given for this opinion was to foster the technical-procurement team effort working toward a common goal. In this regard, several laboratory procurement personnel said that approximately half of the procurement requirements in excess of $2,500 are known to the buyer before the PR reaches the procurement department. This, they said, was the direct result of close technical-procurement interfacing. In recent years several laboratory commanders have officially requested increased purchase authority; however, each case has been disapproved.

Quite the opposite, those in the NAVSUP/NAVMAT procurement staff positions and NRPO-LA, strongly support the centralized procurement system to protect the quality of procurements. One individual said that giving the laboratories their own procurement authority would be like throwing money down the drain. Another suggested that the number of activities with purchase authority, even $2,500, must be reduced to gain more control over the quality of procurements as well as avoid embarrassing protests, appeals and investigations. Moreover, the feeling was expressed by more than one senior official that the time is rapidly approaching when the laboratories will lose their unlimited purchase authority since the cost of maintaining procurement staffs at each laboratory is getting too expensive. In addition, many felt that there was a serious deficit in the inventory of proficient procurement personnel.

Interviews with management of NRPO-LA disclosed that there is no effective system to monitor the throughput of procurements in order to reduce response times. In fact, average, mean or median response times were described as "not meaningful to NRPO-LA". They did admit that a serious personnel turnover (55 percent) had occurred in 1973 which had effected the response time adversely. However, they are a high-quality low-volume procurement activity with a proven reputation in the R&D world so response times cannot be used as the sole measure of their effectiveness. The system in use to insure that procurements are not subjected to delays can be best described as a passive honor system. Each buyer prepares a procurement plan card with milestones based on the projected difficulty, type of procurement method, dollar value, special clearances, and experience of the buyer. This plan, a copy of which may be found in Appendix J, is maintained on the buyers desk until the procurement is completed. At

regular intervals the supervisors concerned will review the cards on each buyer's desk to determine if problems exist.

NRPO-LA was alo queried concerning the possible passage of legislation which will raise the small purchase limitation to $10,000 and the plans they (NRPO-LA) have formed for shifting this workload back to their customers. Two general replies were offered: first, the activities will not be able to handle procurements up to $10,000 because they don't have experience personnel and second, there have been numerous attempts to raise the small purchase limitation in the past--none of which have been successful.

In summary, the mood in the activities visited can best be described as a stalemate; the laboratories and their supporters pursuing additional authority and responsibility while the procurement bureaucracy remains adamantly opposed to further delegation of purchase authority.

D. WORKLOAD SAMPLING RESULTS

During the research on previous studies it was learned that NWC had measured the median processing times at NRPO-LA for PR's with a value of less than $100,000 with the following results:[32]

FIGURE 6

NRPO-LA Median Processing Times for NWC (Fiscal Year 1972)

Value	Number of Days
$2,500 to $5,000	63
$5,000 to $10,000	46
$10,000 to $25,000	53
$25,000 to $50,000	47
$50,000 to $100,000	60

NWC did not compile data on procurements over $100,000 because the additional administrative and legal requirements imposed by higher authority cannot be controlled by NRPO-LA. Personnel from NRPO-LA stated they regard a more logical series of thresholds to be $2,500, $10,000 and $100,000 because of the specific requirements of ASPR and the Navy Procurement Directives (NPD) which seem to increase at each of these amounts.

Figure 6 appears to show that the smallest procurements take the most time to consummate. However, the next group ($5,000 to $10,000) took only 46 days (median statistic) which is the shortest time in the

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[32] Naval Weapons Center China Lake Memorandum 042, Subject: Procurement Process Flow Charts, 12 December 1972.

breakdown. Regardless of the confusion between closely associated dollar value groups there is a disturbing indication presented: all procurements, regardless of value, take a similar time to process.

Figure 7 displays statistics calculated as a result of the Workload Sampling Plan pursued in the research phase of this thesis. The most glaring statistic shows that processing times have degenerated since the NWC study determined median processing times (see Figure 6). This was supported during interviews with NWC personnel. One contributing factor may have been a 55 per cent turnover in personnel at NRPO-LA during 1973.

The upper portion of Figure 7 depicts the breakdown of PR's by dollar value, numbers submitted to NRPO-LA, the Mean ($\bar{X}$) number of days and the Median (X_m) number of days external to NWC except for technical decisions referred by NRPO-LA back to NWC. Regardless of the reasons, these statistics show that the same effort is essentially devoted to all PR's in the $2,500 to $25,000 range. Moreover, these PR's are within NWC's present purchase authority and they constitute 65 per cent of the input from NWC to NRPO-LA.

The lower portion of Figure 7 shows the 90 percent confidence intervals for the entire population of PR's based on the values observed in the sample. The upper limit is a one-tailed interval which gives the number of days within which 90 per cent of all PR's submitted to NRPO-LA should be completed. For example, in the $2,500 to $5,000 range 90 per cent of all PR's should be processed within 78 days.

Conversely, the lower limit gives the minimum number of days that 90 per cent of the PR's submitted to NRPO-LA should take to process. This limit is also one-tailed; thus these two limits cannot be used together to infer a closed interval of processing times. However, the column

FIGURE 7

Analysis of Sampled Purchase Requests

Population: 633 Sample Size: 100 Period: Fiscal Year 1973

Recapitulation:

Forwarded to NRPO-LA	80
Forwarded to Other Activities	5
Cancelled or Retained	15
	100

Specific Breakdown of Sampled PR's:

Value	NWC Median	Number (n)	Mean ($\bar{X}$)	Median (X_m)
$2,500 to $5,000	63	25	68	69
5,000 to 10,000	46	15	69	65
10,000 to 25,000	53	12	63	61
25,000 to 50,000	47	8	108	91
50,000 to 100,000	60	12	99	114
100,000 +	NA	8	98	67

Confidence Intervals:

Value	L_u	L_L	I_c
$2,500 to $5,000	78	58	55 to 80
5,000 to 10,000	86	52	47 to 91
10,000 to 25,000	73	52	49 to 77
25,000 to 50,000	133	82	74 to 141
50,000 to 100,000	117	81	75 to 123
100,000 +	141	54	39 to 156

Definitions:

n = Number of PR's

$\bar{X}$ = Mean Number of Days

L_u = Upper Limit (days)

X_m = Median Number of Days

L_L = Lower Limit (days)

I_c = Closed Interval (days)

P(processing time is less than L_u) = .90

P(processing time is greater than L_L) = .90

P(processing time is between L_1 and L_2) = .90

Processing time = $\frac{\bar{X} - u}{\frac{S}{\sqrt{n}}}$ is t-distributed with n-1 degrees of freedom

headed I_c shows the two-tailed closed interval in which 90 per cent of the PR's submitted should be processed. Using the $2,500 to $5,000 interval again it can be said that 90 per cent of all PR's in this range should be processed in no less than 55 nor more than 80 days.

Another interesting statistic which resulted from the sample was the priority assignment by NWC to the PR's. Out of 100 PR's only six were assigned a priority high enough to justify negotiation under the public exigency exception to ASPR.[33] The remaining PR's were distributed as follows: 45 had priority 07, 30 had priority 09, and 19 did not have a priority assigned indicating a routine requirement. This takes on particular significance in regard to an often levied criticism of Navy laboratories; that all requirements are urgent and if they have increased purchase authority they will abuse the public exigency exception. This statistic tends to refute that charge.

In order to gain an appreciation for the relative difficulty NWC would (or should) have in assuming additional workload from among the PR's now sent to NRPO-LA, copies of PR's for a four-week period during January and February 1974 were collected and categorized using a simple level of difficulty algorithm (see Appendix F). This algorithm was developed as a general tool to use in determining whether or not NWC procurement personnel could process a particular action. NRPO-LA uses a much more complex guide in determining internal assignments by GS level. This analysis was used as a secondary tool to formulate forecasts of grades and numbers of personnel NWC would need for those procurements which are determined, through the use of the algorithm, to be within the

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[33] Title 10 U. S. Code 2304(a)(2).

capability of NWC. This four-week survey resulted in the review of 51 PR's (which closely corresponds to the 633 PR's submitted in Fiscal Year 1973--(51/4)x52=663). Appendix K contains a breakdown of the PR's by type, value and shows if the procurement satisfies the algorithm. Using the algorithm it was determined that NWC should be capable of processing at least 335 actions now processed at NRPO-LA. Approximately 82 per cent of these actions would be between $2,500 and $25,000 (22 of the 27 retention potentials). The following figure is an extraction from Appendix K of four PR's that satisfy the algorithm and four that do not.

FIGURE 8

Extract of Purchase Requests Collected During Four-Week Survey

Item Description	Value (000's)	Satisfies Algorithm? Yes	No
Video Signal Processor	$ 10.0	X	
Oscillator	2.9	X	
Steel	7.6	X	
Trailers	24.0	X	
Computer System	59.8		X
Reports on Studies	45.0		X
Tests	39.4		X
Report	23.5		X

Through the use of the level-of-difficulty analysis (see Appendix M) it is estimated that one GS-11, one GS-9, one GS-7 and one GS-6 should be able to process the projected increase in workload at NWC.

E. SUMMARY

This section has revealed several key indicators in relation to the procurement support problem at NWC. First, the customers of the system are not pleased with the service it presently renders and are taking a

variety of actions in managing the procurements of their respective departments. Second, these same customers are under external pressures to maintain schedules. Third, few felt that the flow of status between the customer and NRPO-LA was adequate for effective management. Moreover, the present system is segmented thereby inhibiting good communications in both directions. Fourth, NWC procurement personnel, while fairly motivated and harmonious, show signs of frustration in gaining more responsibility in the form of more complex procurements. Fifth, there is a split in procurement support philosophy both between the field and the staff/headquarters level and between laboratory oriented personnel and procurement officials. Sixth, workload sampling shows that 40 per cent of all PR's submitted to NRPO-LA are less than $10,000 in value. Moreover, the mean processing times vary little in the $2,500 to $25,000 range. Finally, a significant number of PR's are susceptible to more rapid procurement at the local level using the skills of personnel in the grades GS-6 through 11.

V. ALTERNATIVE SOLUTIONS

In attempting to alleviate the situation at NWC numerous approaches for improving procurement support could be presented for consideration. However, there appears to exist only four general categories of solutions three are elementary and well known while the other is somewhat innovative. These approaches, which will be discussed in detail in succeeding paragraphs, each have an inherent philosophy in regard to the tone of the procurement support system. Each approach is capable of variations to individualize each activities' system.

A. UNLIMITED PURCHASE AUTHORITY

Virtually all laboratory personnel contacted expressed the opinion that the R&D mission requires unlimited purchase authority at each laboratory. In some laboratories this concept is apparently working well and the degree of technical/procurement interfacing is apparently high. Moreover, the commanding officer of a laboratory which has unlimited purchase authority can exercise a greater span of control over those functions which support the mission. Since many laboratories are funded under the Navy Industrial Fund the management of personnel can be simpler in terms of adding personnel to process increasing amounts of work.

The granting of unlimited purchase authority would create a complex set of new requirements including additional personnel, training, facilities and equipment. The infusion of procurement experience from NRPO-LA or other laboratories would be required if NWC would be granted

FIGURE 9

Estimated Minimum Additional Manpower Required at NWC to Exercise Unlimited Purchase Authority

Personnel Category	GS Grade	Number	Salary	Total
Legal	13/14	1	$25,000	$ 25,000
Small Business Specialist	11/12	1	18,000	18,000
Cost/Price Analyst	11/12	1	18,000	18,000
Negotiators	12	2	20,000	40,000
	11	1	17,000	17,000
	7	2	11,000	22,000
	6	2	10,000	20,000
Purchase Services	3/4	5	7,700	38,500
				$198,500

unlimited purchase authority. Legal expertise plus people proficient in the current social and economic programs which impinge on the procurement process would be required. Figure 9 is an estimate of the minimum additional manpower required to exercise unlimited purchase authority at NWC. This estimate was developed by using an unpublished estimate prepared by NWC procurement personnel and revising it downward to reflect more conservative thinking. This estimate differs from the original NWC estimate by 17 people and approximately $200,000 in recurring costs. In 1971 NWC officially estimated that the incremental cost of exercising unlimited purchase authority was approximately one million dollars.[34]

Recently, the Office of Naval Research (ONR) contracted with Control Analysis Corporation of Palo Alto, California to conduct a study on possible alternative configurations for NRPO-LA.[35] This study (referred to hereafter as"the ONR Study") developed similar estimates to those in Figure 9. Specifically, the study estimated that 13 additional people would be required in the GS grade levels of 7, 9, 11 and 12 in order to exercise unlimited purchase authority at NWC. These additional requirements translated into $221,000 plus necessary support costs each year.

In summary, it is realistic to assume that the granting of unlimited purchase authority to NWC would result in a cost of at least $200,00 per year.

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[34] Naval Weapons Center Memorandum 25/EMW:ce, Subject: Unlimited contracting authority; comments concerning, 9 June 1971.

[35] Office of Naval Research Contract N00014-74-0016, Technical Report Number 16-2, January 1974.

B. MAINTAINING THE STATUS QUO

Probably the easiest solution to the procurement support problem at NWC would be to take no action; just let the existing system continue. NWC would not incur additional overhead expenses associated with any increase in the number or complexity of procurements processed internally.

Conversely, maintaining the status quo would not improve response times, nor bring the engineers and procurement personnel closer together, nor improve the flow of status communications, nor reduce the amount of travel between NWC and NRPO-LA, nor better utilize the skills of the "buffers" and other procurement personnel at NWC, nor insure that the highly skilled personnel at NRPO-LA are being used on difficult R&D procurements, nor minimize the cost of processing a procurement. Figure 10 is a comparative estimate for completing a procurement action in the $2,500 to $25,000 range at NWC and NRPO-LA. The NWC data was collected during interviews with buyers and the NRPO-LA data was extracted from the ONR Study. The overhead calculation is rarefied, at best, due to the non-availability of complete overhead data for procurement personnel at NWC. The overhead amount used for NWC represents only the costs of the Procurement Division (less the Purchase Branch) distributed in a similar manner as the ONR Study.

In summary, the status quo alternative will probably increase the workload at NRPO-LA in view of the recent inflationary pressures that will cause more procurements to exceed $2,500. Remaining with the status quo may not increase direct costs; however, significant indirect/intangible costs are associated with such a choice. In addition, the underutilization of NWC procurement personnel coupled with the higher costs at NRPO-LA contraindicates this choice. The desire to reduce procurement lead times

FIGURE 10

Comparative Estimate For Procurements at NWC and NRPO-LA

	NWC	NRPO-LA
Under $10,000:		
Direct Cost (DC)	$ 42.32	$ 72.44
Overhead ($1.32 x DC)	55.86	95.62
	$ 98.18	$168.06
$10,000 to $25,000		
Direct Cost (DC)	$ 65.64	$112.35
Overhead ($1.32 x DC)	86.64	148.30
	$152.28	$260.65

Notes: (1) NRPO-LA data was extracted from the ONR Study prepared by Control Analysis Corporation of Palo Alto, California. NWC data was determined from the experience with the 81 procurements NWC processed during Fiscal Year 1973; the amount for procurements under $10,000 is based on actual experience while the estimate for procurements over $10,000 was derived using the ratio of direct costs experienced at NRPO-LA [(112.35/72.44) x 42.32 = $65.64].

(2) NWC overhead data is not available in the degree of detail comparable to NRPO-LA. Therefore, the same overhead rate was used for both. However, the allocation of the costs of non-buying personnel in the Procurement Division of NWC results in a probable overhead rate of $0.81 per dollar of direct cost.

for routine purchases of supplies and services, as opposed to R&D, makes the maintenance of the status quo disadvantageous.

C. UTILIZATION OF THE FULL PRESENT PURCHASE AUTHORITY

In establishing an organization to process all procurements under $25,000 particular attention would have to be devoted to the true R&D procurement which generally exhibits a higher level of difficulty in processing. Therefore, expertise in the uniqueness of the R&D world would require staffing of additional personnel of higher grades. The ONR Study concluded that four people costing an estimated $58,000 per year plus support costs would be required at NWC to process all requirements up to $10,000. Since there is no estimate of how many people would be required to process all procurements under $25,000 included in the ONR Study, it is assumed that the relative ratio of procurements between $10,000 and $25,000 (see Figure 7) to those under $10,000 can be used to derive an estimate of the additional cost. The information gained in the Workload Sampling together with the estimate of the ONR Study predicts that $82,857 per year plus support costs will be required to process all procurements under $25,000.[36] This compares favorably with the cost of processing all procurements under $25,000 at NUC Pasadena. During Fiscal Year 1973, 500 actions were processed at NUC between $2,500 and $25,000 using four buyers costing approximately $55,000 per year.

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[36] Thirty per cent (12/40) of requirements are between $10,000 and $25,000; hence seventy per cent are under $10,000. If it requires $58,000 to process all procurements under $10,000 then it will take $58,000/.7 or $82,857 to process all requirements under $25,000.

The most pronounced disadvantage which NWC would experience in setting up their own procurement organization would be the requirement for specialized buyers to process the few true R&D procurements which are generated each year. The NWC procurement personnel recognized this when they estimated that it would take 30 people costing over $350,000 per year to process all requirements under $25,000.

The full utilization of present purchase authority would result in NWC processing over 68 per cent of all its requirements over $2,500 vice the present 14 per cent.

D. FLEXIBLE PURCHASE AUTHORITY

In the past the granting of purchase authority has been tied to fixed dollar thresholds. At NWC the $25,000 threshold would, if they chose to exercise the full present purchase authority, permit the procurement of a complex item with detailed specifications under a fixed price arrangement as long as it does not exceed that amount. This could require considerable time and expertise to complete the procurement. On the other hand (using the same assumption), a procurement for a standard commercial product sold in the open market at an established price in excess of $25,000 would have to be sent to NRPO-LA for procurement.

The critical question appears to be how to mesh the present method of granting purchase authority with the realistic situation where procurements have varying levels of difficulty. One could conclude that a simple supply contract for a standard commercial item priced at $95,000 just might be much easier to process than a $20,000 requirement for a level-of-effort pursuing some scientific information.

The results of the PR sampling (see Appendix K) strongly indicated that NWC could, with their present level of competence, process almost 63 per cent of procurements currently being processed at NRPO-LA. This filtering of requirements would provide faster support for the customers, faster response for all of NRPO-LA's customers, more responsibility for procurement personnel at both NWC and NRPO-LA and better work experience for NWC procurement personnel in preparing them for higher graded positions.

The estimated cost to implement such a system of Flexible Purchase Authority would be approximately $15,000. This estimate was computed using the data accumulated in the Workload Sampling, applying the results of the four-week PR survey and using a planning figure of 100 PR's per buyer per year.[37] Therefore, only four people (who are currently available within the Procurement Division) would be required to do the actual buying and two clerical personnel for administrative support.

The disadvantages associated with this type of system would occur in regard to increased responsibility for legal problems, small business, price analysis, etc. However, a projected workload of approximately 315 PR's per year (328 if the $100,000 ceiling is adopted) and the types of items that will be procured should require only minimal legal support. Recalling from the four-week PR survey that only 20 per cent of PR's in the $25,000 to $100,000 range would satisfy the algorithm; hence the degree of price analyses should be within the capability of any procurement professional in the grades of GS-7 and above, particularly if required training courses are completed. In the area of small business

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[37] This compares favorably with experience at NSC San Diego (about 180 PR's per buyer per year) and NUC Pasadena's 125 PR's per buyer per year.

procedures one of the existing members of the procurement team can be designated the small business specialist.

One of the most formidable barriers to this concept of Flexible Purchase Authority would be the reorientation of headquarters thinking. The traditional lines of purchase authority are readily determinable by knowing the estimated dollar value of a particular requirement. Under a system of Flexible Authority a decision process would have to be utilized to determine what degree of procurement expertise should be devoted to an action. In this regard, this approach would not be applicable to all types of procurement support systems; only those which have a dual-nature. The R&D world has such a nature with both complex R&D procurements and requirements for normal supplies and services to support the R&D effort.

In summary, the four alternatives have the following estimated incremental costs per year:

Approach	Cost
Unlimited Purchase Authority	$200,000
Status Quo	none
Full Present Authority	$ 82,857
Flexible Purchase Authority	$ 15,000

However, there are intangibles and/or suspected cost benefits which would accrue to the Navy if a shift from the status quo were to occur. While the costs of processing a particular procurement at NRPO-LA would not decrease, the total budget would be focused on fewer more complex procurements. At the same time, the response time for NWC Technical Departments would decrease to approximately 30 days.[38]

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[38] Experience of NOL, NWL, NUC in procurements which are negotiated and are less than $25,000 coupled with estimates provided by NWC procurement personnel using the 81 procurements over $2,500 as a basis.

VI. CONCLUSIONS AND RECOMMENDATIONS

The results of the research conducted during this thesis indicates that action must be taken to make the procurement support system at NWC China Lake more efficient and effective. The pleas for faster response, better communications and increased personal responsibility from various elements should not be ignored. The utilization of R&D procurement expertise in the procurement of supplies and services of a standard commercial nature is tantamount to an overkill situation. Moreover, certain types of procurements are susceptible to rapid processing by a production method of procurement such as used at the Ships Parts Control Center (SPCC) and the Aviation Support Office (ASO). Conversely, there are procurements which require more people and higher quality manpower in order to protect the rights of the government and obtain a useful product at a fair and reasonable price. Therefore, the overall conclusion of this thesis is that purchase authority in an R&D environment should be assigned selectively and that existing personnel at the R&D activities should be assigned to jobs where there is the largest payoff and where their talents are fully exploited.

A. NWC CHINA LAKE

1. Conclusions

The present system of procurement support, specifically those procurements over $2,500, is not effectively utilizing the skills that the existing grades of personnel at NWC either possess or could acquire

through training and experience. In discussions with the GS-9's through GS-12's in the Procurement Management Branch, it is evident that they are inundated with clerical work associated with PR preparation and status reporting on outstanding PR's. The only function which appears to be providing some measure of skill utilization (and challenge) is the post-award (RACA) functions.

The grade levels of procurement personnel in the Supply Department are high enough to permit more responsibility as opposed to more busy work. Personnel in the Civil Service Classification Series 1102/1105 in the grades of GS-5 and above should be given the opportunity to develop their procurement skills through work experience supplemented with appropriate training. In the Purchase Branch only the GS-12 supervisor is designated as a contracting officer for procurements over $2,500; the GS-9 and 7's are only involved in negotiating the terms and conditions of the particular procurement. Moreover, the delegation of authority to sign Purchase Orders under $2,500 was limited to the GS-9 and 12. The positions which have immediate job enrichment opportunities by maximum delegation of authority to sign contracts/orders on behalf of the government are the GS-7's and above. This would enable a "cradle-to-grave" attitude to prevail in which the more competent buyers would have almost full involvement with any particular procurement.

In early 1972 a review was made of the management services provided by NWC and NRPO-LA.[39] This review made nine recommendations which are contained in Appendix L. Unfortunately, the first, fifth and eighth

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[39] Captain R. H. Diggle, SC, USN and Lieutenant Commander John R. Dolina, SC, USN Memorandum for Vice Admiral G. E. Moore, SC, USN, Subject: China Lake Trip Report, 18 January 1972.

recommendations were never implemented. Each of these recommendations would have had immediate effects on the responsiveness of the procurement support system at NWC. In the case of physically locating the Contract Managers with the technical codes this would have narrowed the communication gap that obviously existed then as well as now. Had physical dispersal of procurement personnel been accomplished the reliance on departmental "buffers" would have been diminished and the talents of these people used on more productive functions. The 1972 Management Review concluded that the present location of the Contract Managers in the Supply Department has resulted in "more liaison with NRPO-LA than with the NWC Technical Codes."

The system to provide feedback to requesting departments on PR's in NRPO-LA can only be described as primitive. The absorption of the NRPO-LA negotiator's time in answering numerous phone calls and receiving an endless parade of visitors from various activities as well as businessmen is extremely ineffective and uneconomical. NWC has recently developed a document tracking system called Request Information Management System (RIMS).[40] This system will provide a means of management information as well as a complete audit trail of transactions. The management information will include a Cumulative Report of Work-in-Process which will provide visibility of stub requisition which have not been placed under contract. Since the system provides remote terminal inquiry the requesting department will be able to determine the status on outstanding requirements without interferring with present work efforts. It is evident that RIMS

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[40] Naval Weapons Center, China Lake, Operating Procedure, Subject: Request Information Management System (RIMS), 18 July 1973.

could be expanded to include the PR's forwarded to NRPO-LA and thus improve the flow of information back to the requestor.

There is a duplication of effort in the preparation of stub requisitions and PR's. This duplication arises when a "buffer" prepares a stub requisition complete with specifications, supporting statements, evaluation criteria, etc., and then the NWC Supply Department Procurement Management Branch prepares a PR with much of the same information as contained in the stub requisition. If the physical dispersal of the Contract Managers previously discussed were to occur then it would be beneficial to have the procurement representative located in the various departments prepare a PR. The Supply Department could still review and forward the procurement package to NRPO-LA.

The replies to the personnel questionnaire in the areas of Working Conditions, Supervision, and NWC Policy and Administration indicates a mixed amount of dissatisfaction in these areas. While a general indication of general unhappiness cannot be concluded, it would be beneficial for the NWC Supply Department to further investigate potential problem areas and take appropriate action.

In reviewing the several NWC plans for increased purchase effort, it is apparent that the estimates, one of $375,000 and another of one million dollars, need an independent evaluation. No known procurement workload structure would support the kind of figures generated by NWC. Using several other laboratories general workload of about 100 PR's per year would indicate that NWC should be able to process their 500 to 600 PR's with many fewer people than their estimates show.

2. Recommendations

a. In order to maximize the use of existing staffing levels in both the Supply Department and the technical departments the procurement liaison personnel ("buffers") within the various departments should be administratively transferred to the Supply Officer. However, they as well as the GS-12's in the Procurement Management Branch of the Supply Department should be physically dispersed into the departments they serve.

b. A Formal Purchase Section should be established in the Purchase Branch of the Procurement Division. This section should be staffed with two GS-11's and one GS-9 remaining after the dispersal of GS-12's from the Procurement Management Branch. In addition, two GS-7's should be reassigned within the Purchase Branch to support the new Formal Purchase Section. This section would be responsible for procurements selected by the Head of the Purchase Branch for local processing using the Flexible Purchase Algorithm modified to reflect a $25,000 ceiling instead of $100,000. This ceiling should remain in effect until completion of test application and until the Naval Supply Systems Command accepts the algorithm concept. Typically all stub requisitions under $25,000 would be screened for possible retention. Those retained would be assigned to a negotiator using NRPO-LA's (or similar) level of difficulty analysis. Those stub requisitions which do not satisfy the algorithm would be either returned to the requesting department or assigned to a negotiator for PR preparation. If the workload permits the best method would be the latter. In estimating the number of possible procurements which could be retained, the results of the Workload Sampling and the PR Survey were combined and used to determine that approximately 315 PR's would be candidates for

retention each year.[41] In addition, the 81 retained during Fiscal Year 1973 would make a projected workload of 396 PR's per year. With five buyers this translates into an individual workload of 79 PR's per year, which is lower than the experiences of other laboratories. Hence, the existing staffing reassigned to more productive functions should be more than adequate to process the added requirements. Moreover, should NAVSUP accept the concept of Flexible Purchase Authority and set the algorithm ceiling at $100,000, NWC should be capable of assuming increased workload. Clerical support for this section should be the only incremental cost (recurring) and is estimated at two GS-3/4 Procurement Clerks costing approximately $15,000 per year.

c. In assuming additional procurements, as recommended above, there should be no associated increase in overhead personnel, other than the minimum number of clerical people for direct support of the proposed section. This recommendation is specifically directed against the addition of staff personnel at levels above the Formal Purchase Section as proposed.

d. All positions in the Procurement Division should be closely reviewed to insure that appropriate contractual functions are delegated to the maximum extent possible. In this regard, GS-7's and above should be considered for designation as a contracting/ordering officer based on personal competence and training. In conducting this review the primary focus should be on job enrichment vice horizontal job loading (busy work).

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[41] The Workload Sampling showed that 52 of the 80 PR's submitted to NRPO-LA were under $25,000. The survey of PR's showed that 22 of 23 under $25,000 were candidates for retention. Therefore, [(52/80) x (22/23) x (633 x .8)] equals 315. If the ceiling is raised to $100,000, the potential number of PR's increases to 328.

The goal should be more authority, responsibility and opportunity for individual achievement.

e. RIMS should be immediately expanded to provide status on outstanding PR's submitted to NRPO-LA. In this regard, NRPO-LA should be requested to provide input to the system on a regular (as least weekly) basis.

f. The preparation of PR's should be accomplished by procurement liaison within each department, assuming that recommendations a and b are implemented.

g. Additional research should be conducted in regard to employee motivation within the Procurement Division. Specifically, it is recommended that a research agreement be entered into with the Naval Postgraduate School, possibly as a thesis project. In the interim, management should devote primary emphasis to Recognition and Achievement; adoption of recommendations a, b, c and d should assist in this area.

h. NWC management should refuse to accept internally prepared cost estimates for assuming additional procurement functions without some independent audit/comparative analysis. The Central Staff should question all estimates and use empirical data obtained from other laboratories as reference to form an opinion concerning the validity of the internally prepared estimates.

i. Formal Advertising will, undoubtedly, be required for a few of the procurements which would satisfy the algorithm. Since Formal Advertising is the preferred method of procurement, these requirements should not be automatically passed to NRPO-LA; they should be retained and processed as a device for training and professional growth. This will enhance job enrichment and place the procurement personnel at NWC in a more competitive position when seeking higher level positions.

In summary, NWC should adopt a more independent attitude in regard to their procurement support system. They should form and maintain a basic capability which can provide responsive support to the technical departments and permit the centralized system (NRPO-LA) to provide quality and timely procurement support for requirements with a high level of difficulty.

B. NRPO-LA

1. Conclusions

Response times for procurements are not a primary concern at NRPO-LA because they are not a production oriented procurement activity like an Inventory Control Point (ICP) which handles thousands of procurements each year. However, there are procurements which lend themselves to production techniques. Examples would include routine supplies and services requirements.

NRPO-LA does not perceive a need for a monitoring system or status system due to the low number of procurements processed each year.

2. Recommendations

a. A positive PR monitoring and status reporting system should be developed to provide customers with regular information on their outstanding PR's. In addition, appropriate management information should be included in the design of this system to insure that processing times are minimized. In this regard, if computer availability is the primary obstacle to adopting this recommendation, it is recommended that NWC China Lake be asked to permit NRPO-LA to use or tie into the existing system.

b. Encourage and assist, through the Field Management Division, customer activities to retain and process procurements within their present authority and grade levels of procurement personnel. In this regard, the customers should be assisted in employee development through training and experience either on-site or at NRPO-LA.

C. NAVAL SUPPLY SYSTEMS COMMAND

1. Conclusions

In attempting to determine the focus of the Navy Field Purchasing System, the primary concern of many senior military and civilian officials appears to be on continuously increased centralization regardless of the mix of procurement actions despite the NRPO concept which implies a certain degree of decentralization. One individual alluded to a possible reduction in the number of activities with purchase authority; thus the numerous small procurement offices with authority up to $2,500 and a workforce of three or four would be eliminated and the workload centralized at a large procurement activity.

The need for a plan to standardize staffing of procurement organizations based on actual workload difficulty vice dollar value thresholds has not yet been recognized. Several individual activities, including NRPO-LA, have developed techniques for procurement assignments and staffing requirements; however, a system-wide plan has not been formulated.

The program to provide future procurement experts appears to be primarily an individual activity effort rather than a coordinated and integrated system managed from the headquarters level through representatives in the field.

2. Recommendations

a. Develop customer-oriented plans for the Field Purchase System recognizing the need for customers to help themselves to the maximum extent possible. Moreover, R&D procurement appears to offer significant opportunities for an innovative departure from the traditional procurement support philosophy. Centralized procurement activities should provide a high level of expertise which is devoted to procurements worthy of their skills.

b. The Field Management Divisions located at the NRPO's should be responsible for career development and job enrichment at all activities within their areas of responsibility.

c. The proposed increase in the small purchase ceiling from $2,500 to $10,000 should be viewed as an aid to the Field Purchase System rather than a potential administrative headache.

d. There are several areas of potential benefit which may require further study. These include the establishment of a "corporate policy" in regard to procurement trainees which would establish uniform procedures and build in features such as mobility training, establishment of functional specialists among the NRPO's to process all procurements of a particular type rather than only a limited geographical area and possible expansion of the Simplified Purchase Procedures for procurements over $2,500.

D. CHIEF OF NAVAL MATERIAL

1. Conclusion

There has been a long debate within the Naval Material Command concerning the role of procurement at the Navy Laboratories. There has

been little progress toward establishing a policy which will set the tone for procurement support at Navy Laboratories.

2. Recommendations

a. Establish a firm policy on laboratory procurement support that considers each laboratory as an integral part of a system. This policy should manifest itself in the development of a Navy Uniform Laboratory Procurement System (NULAPS) which should be founded on the following concepts:

(1) Laboratory procurement is primarily to support the unique R&D function; hence a unique support system is required.

(2) Laboratories should operate under a uniform policy of purchase authority based on levels of difficulty rather than fixed dollar amounts. The Flexible Purchase Authority should be adopted using the algorithm contained in Appendix F.

(3) There is a need for central cadre's of R&D procurement expertise where complex procurements can be processed and training in the R&D area performed.

(4) Uniform timeframe standards for procurement throughput should be established and published.

b. There are several areas for further consideration which are outside the scope of this thesis:

(1) Should a project be established at the NAVMAT level which will insure the proper development, test and evaluation, and implementation of NULAPS?

(2) Should one east coast and one west coast laboratory be designated to test the concept of Flexible Purchase Authority before the final decision to implement it in all laboratories is made?

(3) Should the Navy pioneer an effort to gain the assistance of the Secretary of Defense in developing a class Determination and Findings (D&F) designating all procurements under $10,000 as negotiable under the Public Exigency exception to the requirement for Formal Advertising? This D&F would merely recognize the potential economic benefits contained in the findings of the Commission on Government Procurement.[42]

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[42] Report of the Commission on Government Procurement, Recommendation 7, Chapter 3, December 1972.

APPENDIX A

OPERATING PRINCIPLES

NAVAL WEAPONS CENTER
China Lake, California

1. The Naval Weapons Center is a primary research, development, and test activity of the Naval Material Command. The Commander, Naval Weapons Center is responsible to the Chief of Naval Material for administering assigned funds, conducting operations, and accomplishing the mission of the Center.
2. The mission of the Naval Weapons Center is to originate and analyze new ideas in weapons systems and related fields of science and technology; to advance them through research, development, experimental production, test, and evaluation; and to assist in introducing the resultant weapons systems and technology into production and service use.
3. The technical program of the Center is planned jointly by the Chief of Naval Material and the Commander, Naval Weapons Center and is integrated and positively directed toward accomplishing the mission.
4. To accomplish the mission, superior military and civilian personnel are essential, each with proper authority and responsibility, each complementing the other, and each supported by adequate facilities and funds.
5. The Commander, a senior naval officer, is responsible to the Chief of Naval Material for all phases of operation of the Center. He delegates line authority to the Technical Director for the technical program.
6. The Commander and the Technical Director are jointly responsible to the Director of Navy Laboratories for policy matters affecting the Center and interlaboratory relations, and for the effective and economical internal functioning of the Center in accomplishing the mission.
7. The Technical Director, a recognized civilian scientist or engineer, is responsible to the Director of Laboratory Programs for implementing technical guidance affecting the Center.
8. The Deputy Technical Director and the Deputy Commander are jointly responsible to the Commander and Technical Director for directing and integrating the work of all departments in accomplishing the mission.
9. The Heads of Departments are responsible to the Deputy Technical Director and the Deputy Commander for providing leadership in their respective programs in supporting and accomplishing the mission.
10. The primary function of all groups of the Center is to further the technical program. All departments participate according to their responsibilities in accomplishing the mission of the Center.
11. The responsibility of the professional staff is to produce superior technical accomplishments in research, development, design, experimental production, test, and evaluation of weapons systems.
12. The primary responsibility of the technical officers of the armed services attached to the Center is to assist and advise the civilian technical staff on matters relating to the development of naval material designed to meet service requirements and operating conditions.
13. The Naval Weapons Center is an integral part of the Naval Establishment. Its personnel, military and civilian, are equally a part of that establishment. Every effort is made to provide opportunities for professional advancement and recognition, to the end that all will be proud that they are a part of the Navy.

Approved 12 May 1971:

APPENDIX B

25/EMW:ce
4200
Serial 2693
25 June 1970

From: Commander, Naval Weapons Center
To: Chief of Naval Material (MAT 0331)
Via: Commander, Naval Supply Systems Command (SUP 02)

Subj: Plan to revise purchase support responsibility for NWC China Lake; forwarding of

Ref: (a) NUC Pasadena ltr 00/GRL/sb Ser 1668 of 30 Nov 1967
(b) NAVMAT ltr MAT 0331:JEC Ser 474 of 18 Dec 1967
(c) NAVMAT ltr MAT 0212:LTH of 20 Dec 1967
(d) NAVSUP ltr SUP 021A of 9 Jan 1968

Encl: (1) Recap of NUC Purchase Division of 5 May 1970

1. Background

a. Prior to 1 July 1967, the Naval Ordnance Test Station (NOTS) was located at China Lake with an annex at Pasadena, California. Since Pasadena was close to Los Angeles and a good market area, the bulk of the purchase organization was located at Pasadena. On 1 July 1967, NOTS became two separate organizations, Naval Weapons Center, China Lake (NWC) and Naval Undersea Research and Development Center, Pasadena (NUC). Although in excess of seventy-five percent of the purchase actions were in direct support of NWC, all purchase personnel located at Pasadena were transferred to NUC. In view of the difficulties encountered in trying to obtain billets, personnel, etc. to establish an independent purchase group for NWC, it was decided that NUC would provide service on a cross-serving basis.

b. Reference (a) requested that the Chief of Naval Material formalize arrangements for NUC to continue cross-servicing NWC for procurement. By reference (b), CNM concurred in this arrangement and reference (c) requested the Naval Supply Systems Command to provide necessary purchasing implementation. Reference (d) granted continuing purchase authority up to $25,000 per transaction to NWC and stated: "Notwithstanding this authority, NUC will continue to provide purchase support to NWC up to $25,000 per transaction. Procurement requirements in excess of the $25,000 limitation, either for NWC or NUC, will continue to be forwarded to the Navy Purchasing Office, Los Angeles for action."

c. The Naval Weapons Center is currently receiving purchase support from four separate sources, which are outlined and defined as follows:

Subj: Plan to revise purchase support responsibility for NWC China Lake; forwarding of

(1) $0 to $2,500. Director of Supply, Naval Weapons Center, China Lake. Limited to local purchases and local trade area, Basic Purchase Agreements, orders against existing GSA, DSA and Federal Supply Schedules and emergency requirements. Currently this function is staffed by a total of six personnel including one Supervisory Purchasing Agent, one Procurement Clerk, one Supply Assistant and three Purchasing Agents. During the past twelve month period, this branch accomplished 17,994 separate actions, which represents approximately 40 percent of NWC requirements falling between 0 - $2,500.00 category.

(2) $0 to $25,000.00. Director of Supply, Naval Undersea Research and Development Center, Pasadena, California. This service is provided by an Intra-service Support Agreement between NUC and NWC. During Fiscal Year 1970, NWC paid NUC $393,581.00 for this service. The NUC Pasadena Purchase Division, as of 5 May 1970, is staffed by a total of 55 personnel - the breakdown of personnel categories is per enclosure (1). During the past twelve month period NUC accomplished 25,785 separate actions between $0 - $2,500.00, which represents approximately 60 percent of NWC requirements falling between $0 - $2,500.00. During the same period of time NUC accomplished 879 separate actions between $2,500.00 - $25,000.00 which represents 100 percent of NWC, China Lake requirements in this category. The Navy Purchasing Office, Los Angeles (NPOLA) accomplished 200 actions between $2,500.00 and $25,000.00 for NWC, Corona Laboratory during this period.

(3) $25,000.00 and over. Officer in Charge, Navy Purchasing Office, Los Angeles, California. The Naval Supply System Command provides NPOLA the required billets and funding to support NWC contractual requirements. During the immediate past twelve month period NPOLA has processed 88 new contractual actions for NWC.

(4) In addition to the above, NWC Corona Annex, Corona, California, has a Purchase Branch composed of eleven personnel who are providing purchase support for the Corona Annex and for the Fleet Missiles Systems Analysis and Evaluation Group (FMSAEG). This Purchase Branch provides purchase support from $0 - $2,500.00. All purchase requests over $2,500.00 are accomplished by NPOLA for Corona and FMSAEG. The consolidation of the Corona function with NWC is due to be completed by 1 July 1971, with the first increment of transfer of functions and personnel to NWC, China Lake by 1 October 1970.

(5) The proposed supply organization for FMSAEG includes a purchase division to provide purchase support up to $2,500.00.

2. NWC proposes to implement the following plan to provide purchase support for NWC China Lake. The objectives of this proposal are to:

Subj: Plan to revise purchase support responsibility for NWC China Lake; forwarding of

a. Simplify purchase support by consolidating purchase in two locations (NWC China Lake and NPOLA) in lieu of the present four locations.

b. Retain within NWC the purchase expertise of the Corona Procurement Branch by transferring the purchase function, billets and most procurement personnel to NWC China Lake.

c. Decrease the overhead costs for procurement by decreasing the amount of money required for the intra-servicing agreement with NUC Pasadena.

d. Take advantage of the economies afforded by a centralized procurement concept.

3. In viewing the pending consolidation of the Corona function with China Lake, NWC plans to transfer seven personnel from the Corona Purchase Branch to augment the Purchase Branch at China Lake up to a total of 13 people in the Small Purchase Branch. With this group NWC intends to ultimately accomplish all purchases under $2,500.00 from China Lake. It is probable that NWC will be required to add personnel at various time intervals in order to meet and maintain timely procurement support. It is currently planned to move the first increment of purchase personnel from Corona to NWC on or about 15 August 1970. It is estimated that there will be 45,000 to 50,000 purchase actions under $2,500.00 during FY 71.

4. Procurement actions over $2,500.00 will be forwarded to Officer in Charge, NPOLA. It is recognized that procurements in excess of $2,500.00 have been minimal; however, to provide the flexibility required for good management to react to emergency situations it is desired to retain the present $25,000.00 authority. It is estimated that 800-900 purchase actions will be added to the NPOLA work load during FY 71. NPOLA has confirmed its ability and desire to provide these services to NWC China Lake.

5. It is anticipated that NWC will have established a purchase capability independent of NUC Pasadena by 1 January 1971, and it is planned to terminate the intra-service support with NUC Pasadena as soon as NWC has established a purchase capability which will meet and support our requirements. In the interim, NWC plans to immediately renew the support agreement with NUC Pasadena for a period of 90 days with renewal options of 90 days. Such an agreement will not exceed the FY 70 funding level.

6. Implementation of this plan could mean an eventual reduction of personnel at NUC Pasadena. However, in consideration of the reduced funding situation and the direct savings in dollars, good management judgment dictates that NWC proceed with the implementation of the plan as soon as practicable.

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Subj: Plan to revise purchase support responsibility for NWC China Lake; forwarding of

7. The above plan will save approximately $400,000.00 annually, which is essentially the dollars now paid NUC Pasadena for purchase support.

8. It is therefore requested that NAVSUP and CNM concur in concept with the plan outlined so that NWC may initiate implementing action.

J. K. McCONEGHY
By direction

Copy to:
NUC Pasadena
NPOLA
NWC Corona

5 May 1970

FY 1970 (4th Qtr)

NUC PURCHASE DIVISION

Salaries	Number Personnel
Chargeable to both NUC and NWC	
Head, Purchase Division	1
Industrial Manufacturing Branch:	
Industrial Specialists	6
Contracts Branch:	
Contract Negotiators	11
Purchasing Agents	12
Contract Admin. Branch:	
Contract Administrators	4
Clerical Force	14
	48
Not chargeable to NWC	
Contract Admin. Branch:	2
Major Programs Branch:	5
	7
GRAND TOTAL	55

Purchase Transactions - 12 Month (Actual - May 1969 thru April 1970)

	NUC	NWC
0-2500	10,025	25,785
2500-25,000	477	879
Intra-gov't procurement	1,599	1,784
TOTAL	12,101	28,448
	29.8%	70.2%

Encl. (1)

APPENDIX C

NAVSUP FORM (TEST) 1440-NWC-(OP)-4270 — PAGE 1 OF 2 PAGES

1. PRIORITY	2. DATE DELIVERY DESIRED/REQUIRED (SPECIFY WHICH)	3. C S RATING (CHECK ONE)	4. P. R. NO.
07	31 May 1974	[X] DO [ ] DX A7	N60530-74-103307-21

5. TO:
OFFICER IN CHARGE
NAVAL REGIONAL PROCUREMENT OFFICE
LONG BEACH, CALIFORNIA 90801

6. FROM:
COMMANDER (CODE 252)
NAVAL WEAPONS CENTER
CHINA LAKE, CALIFORNIA 93555

7. SHIP TO-MARK FOR:
RECEIVING OFFICER
NAVAL WEAPONS CENTER
CHINA LAKE, CALIFORNIA 93555

8. NAME, CODE, PHONE NO. OF REQUIRING ACTIVITY CONTRACT ADMINISTRATOR (EXCEPT
J. J. Wright, Code 2521, Ext. 3897

9. INSPECTION/ACCEPTANCE BOTH AT (SOURCE) OR (DESTINATION - BLOCK 7) OR OTHER COMBINATION(S):

10. PACKAGING/PACKING
[X] MIN. COMMERCIAL [ ] SPECIFIED HEREIN

11. ACCOUNTING DATA: APPROPRIATION AND SUBHEAD	OBJ. CLASS	BUREAU CONTROL NUMBER	SUB-ALLOT.	AUTHORIZATION ACCTG ACTIVITY	TRANS. TYPE	PROPERTY ACCTG ACTIVITY	COST CODE	AMOUNT
AA 17 X 4912.3733	000	77777	0	060530	2F	000000		$8,235.00

J.O.: 62345602 STUB REQN NO.: 3452-3198-74

ITEM	SUPPLIES OR SERVICES (NOMENCLATURE, FSC, PART NO., ETC; AND, SPECIFICATION OR, PURCHASE, DESCRIPTION)	QUANTITY	UNIT	ESTIMATED UNIT PRICE	ESTIMATED TOTAL PRICE
0001	Econder, Baldwin Electrobics Mod. #682HBGL for AN/MPQ-45 Radar System.	2	ea.		

SOLE SOURCE JUSTIFICATION: These specific units are required for direct replacement in the AN/MPQ-45 Radar System. The radars were designed to use these specific encoders Due to critical mounting configuration, size, electronic interfacing and accuracy relia bility, no other manufactures encoders can be interchanged in the radars.

The AN/MPQ-45 System is one of Kind composed of three (3) radars designed and manufac- tured for NWC Countermeasures Programs. There are no other radars like these in existence.

Prior procurement for these specific encoders were made under Contract N00123-72-C-0143 and N00123-72-C-2765.

NOTE TO NRPOLB: ADVANCE COPY OF EACH VOUCHER/INVOICE PROCESSED FOR PAYMENT WILL BE SEN TO COMMANDER, NAVAL WEAPONS CENTER, CHINA LAKE, CALIFORNIA 93555, ATTENTION: CODE: 17621.

12. IF THE ESTIMATE IS OVER $250, IS SPECIFICATION OR PURCHASE DESCRIPTION CONSIDERED ADEQUATE FOR PRICE COMPETITION? [ ] YES [ ] NO

13. P.R. TOTAL ESTIMATED PRICE $8,235.00

15. SOURCES OF SUPPLY
Baldwin Electronics (415)-321-7840
1101 McAlmount Street
Little Rock, Ark.

COMPARABLE ITEMS FROM MANDATORY FEDERAL SOURCES ARE: [ ] AVAILABLE & REASON FOR NOT ORDERING ATTACHED [X] NOT AVAILABLE [ ] NOT KNOWN DUE TO UNAVAILABILITY OF GOVT SCHEDULES

16. SOLE SOURCE JUSTIFICATION

See herein

17. PRIOR PROCUREMENT DATA ON _____ SAME, OR _____ SIMILAR ITEM (CHECK ONE)

CONTRACT/ORDER NO.	UNIT PRICE	QTY	DATE	SUPPLIES

18. AUTHORIZING OFFICIAL (NAME AND TITLE)
J. J. WRIGHT, PROCUREMENT MGMT. BR.

19. SIGNATURE James J. Wright

20. DATE 1-31-74

APPENDIX D

Procurement Lead Time Chart

(Exerpted from Attachment 3 to NRPO-LA Procurement Guide)

	Approximate Time Required Calendar Days	
	MIN	MAX
	7	60
RECEIPTS OF REQUISITION BY NPOLA		
Screening for Mandatory Information	1	3
Assignment to Appropriate Negotaitor	0	3
Clarification of Requisitioned Requirements	0	14
Local Procurement Plan/Negotiation D&F/Type of Contract Justification/Synopsis/Set-Aside(s)/Sole Source Justification	1	14
Preparation and Submission of RAN with D&F/ Type of Contract Clearance for Approval by CNM and ASN(when not submitted with APP)	7	60
Pre-Solicitation Qualification Through Synopsis and Technical Evaluation of Responses to Qualify Vendors for Solicitation	10	30
Preparation and Mailing of IFB or RFP	3	7
Vendors' Preparation and Submission of Bid or Proposal	14	60
Abstract of Bids or Proposals; Review for Clarification or Corrections; Referral for Technical Evaluation	1	.5
Technical Evaluation by Customer Activity and Preparation of Recommendation on Source Selection for Further Negotiation/Award	5	60
Obtain Audit Report; Perform Cost or Price Analysis; Determine Areas to Negotiate	5	60
Preparation and Submission of Pre-Negotiation and Post-Negotiation Business Clearances for Approval by Local Review Board	3	14
Pre-Negotiation Business Clearance Preparation and Approval by CNM for Awards $2,000,000 and Over/Other Special Conditions	10	30
Negotiation Effort on Technical/Price/Terms	1	28
Post-Negotiation Business Clearance Preparation and CNM Approval	5	14
Draft, Legal Review, Type, Assemble and Distribute Contract	3	10
Contractor Review of Contract; Revision; Execution	5	30

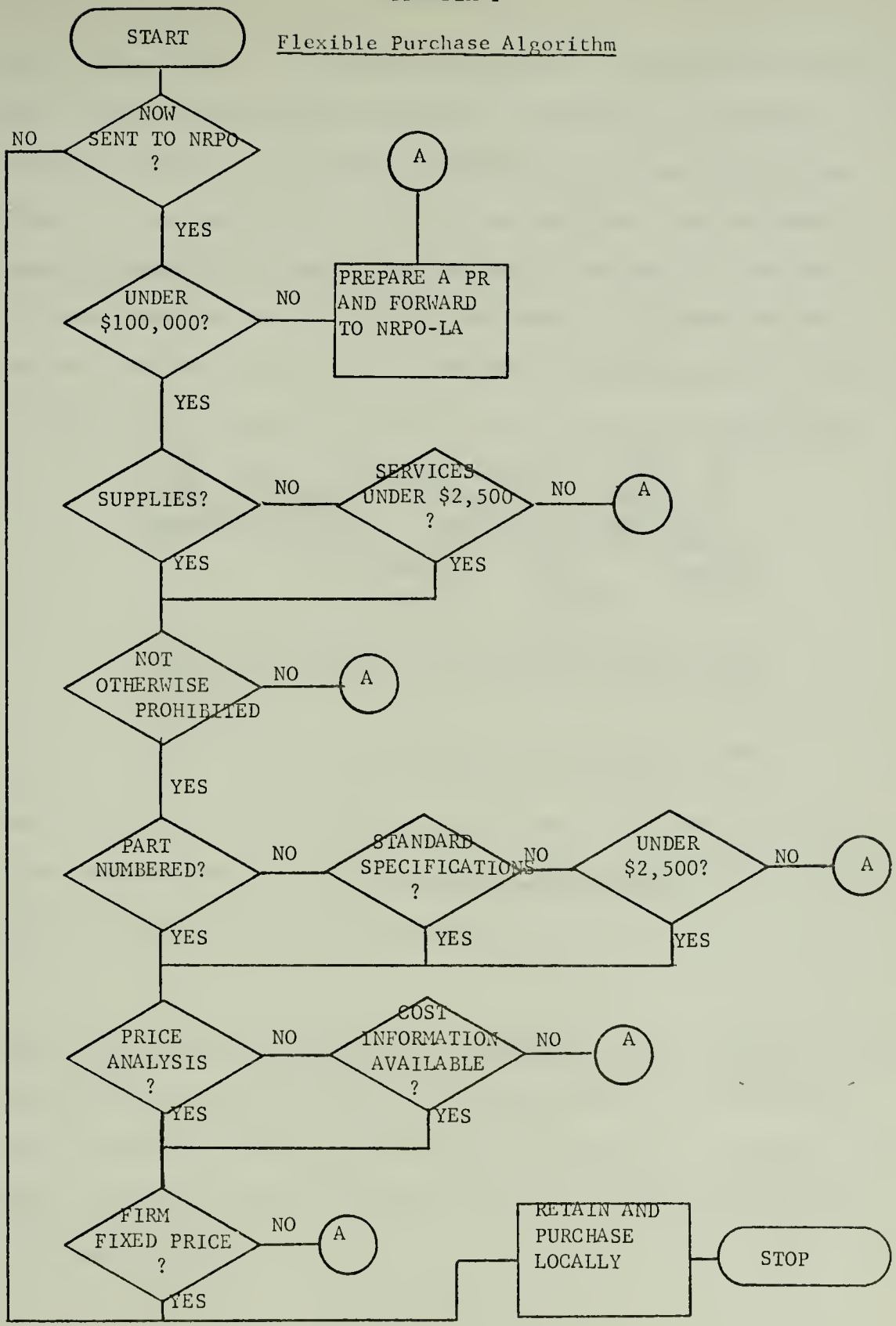
APPENDIX E

NWC China Lake Procurement Division Position & Salary Synopsis

Procurement Division:	Grade	Number	Salary
Supervisory Contract Administrator	GS-13	1	$ 26,189
Clerk-Typist	GS-5	1	9,931
Clerk-Typist	GS-4	2	16,076
Sub-total			$ 52,196
Procurement Management Branch:			
Contract Administrator	GS-12	5	$100,311
Contract Specialist	GS-11	2	32,276
Contract Administrator	GS-9	1	12,573
Sub-total			$145,160
Purchase Branch:			
Procurement Officer	GS-12	1	$ 17,497
Contract Specialist	GS-9	1	14,197
Purchasing Agent	GS-7	4	44,197
Purchasing Agent	GS-6	8	82,879
Purchasing Agent	GS-5	1	9,931
Procurement Clerk	GS-5	1	8,323
Purchasing Agent	GS-4	1	8,158
Procurement Clerk	GS-4	3	25,674
Procurement Clerk	GS-3	2	14,598
Clerk-Typist	GS-3	1	7,697
Clerk-Typist	GS-2	2	11,364
Sub-total			$244,505
Grand Total			$441,861

APPENDIX F

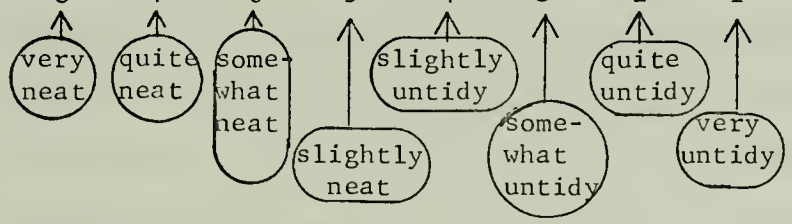
Flexible Purchase Algorithm



APPENDIX G

People differ in the ways they think about those with whom they work. This may be important in working with others. Please give your immediate, first reaction ot the items that follow. These items have words which are opposite in meaning, such as Very Neat and Not Neat. You are asked to describe someone with whom you have worked by placing an "X" in one of the eight spaces on the line between two words. Each space represents how well the adjective fits the person you are describing. For example:

Very Neat:____:____:____:____/____:____:____:____:Not Neat
8 7 6 5 4 3 2 1



If you were describing someone who you thought was a little bit sloppy, you would place an "X" on the line over #4, like this:

Very Neat:___:___:___:___/ X :___:___:___:___:Not Neat
8 7 6 5 4 3 2 1

Look at the words at both end of each line before you put in your "X". Please remember that there are no right or wrong answers. Please do not omit any items and mark each item only once.

I

Think of the person with whom you can work best. He (or she) may be someone you work with now, or he may be someone you knew in the past. He should not necessarily be the person you like the best, but should be the person with whom you have been able to work best. Describe this person as he appears to you.

	8	7	6	5	4	3	2	1	
Pleasant	:	:	:	:	/	:	:	:	:Unpleasant
Friendly	:	:	:	:	/	:	:	:	:Unfriendly
Rejecting	:	:	:	:	/	:	:	:	:Accepting
Helpful	:	:	:	:	/	:	:	:	:Frustrating
Unenthusiatic	:	:	:	:	/	:	:	:	:Enthusiastic
Tense	:	:	:	:	/	:	:	:	:Relaxed
Distant	:	:	:	:	/	:	:	:	:Close
Cold	:	:	:	:	/	:	:	:	:Warm
Cooperative	:	:	:	:	/	:	:	:	:Uncooperative
Supportive	:	:	:	:	/	:	:	:	:Hostile
Boring	:	:	:	:	/	:	:	:	:Interesting
Quarrelsome	:	:	:	:	/	:	:	:	:Harmonious
Confident	:	:	:	:	/	:	:	:	:Hesitant
Efficient	:	:	:	:	/	:	:	:	:Inefficient
Gloomy	:	:	:	:	/	:	:	:	:Cheerful
Open	:	:	:	:	/	:	:	:	:Guarded

II

Now, think of the person <u>with whom you can work least well</u>. He may be someone you work with now, or he may be someone you knew in the past. He does not have to be the person you like least well, but should be the person with whom you had the most difficulty in getting the job done. Describe this person as he appears to you.

Pleasant	:	:	:	:	/	:	:	:	:Unpleasant
Friendly	:	:	:	:	/	:	:	:	:Unfriendly
Rejecting	:	:	:	:	/	:	:	:	:Accepting
Helpful	:	:	:	:	/	:	:	:	:Frustrating

	8	7	6	5	4	3	2	1	
Unenthusiastic:	___	___	___	___	___	___	___	___	:Enthusiastic
Tense	___	___	___	___	___	___	___	___	:Relaxed
Distant	___	___	___	___	___	___	___	___	:Close
Cold	___	___	___	___	___	___	___	___	:Warm
Cooperative	___	___	___	___	___	___	___	___	:Uncooperative
Supportive	___	___	___	___	___	___	___	___	:Hostile
Boring	___	___	___	___	___	___	___	___	:Interesting
Quarrelsome	___	___	___	___	___	___	___	___	:Harmonious
Condident	___	___	___	___	___	___	___	___	:Hesitant
Efficient	___	___	___	___	___	___	___	___	:Inefficient
Gloomy	___	___	___	___	___	___	___	___	:Cheerful
Open	___	___	___	___	___	___	___	___	:Guarded

III

Now, describe the <u>atmosphere of your group/section/unit</u> by marking the following:

Friendly	___	___	___	___	___	___	___	___	:Unfriendly
Accepting	___	___	___	___	___	___	___	___	:Rejecting
Satisfying	___	___	___	___	___	___	___	___	:Frustrating
Enthusiastic	___	___	___	___	___	___	___	___	:Unenthusiatic
Productive	___	___	___	___	___	___	___	___	:Nonproductive
Warm	___	___	___	___	___	___	___	___	:Cold
Cooperative.	___	___	___	___	___	___	___	___	:Uncooperative
Supportive	___	___	___	___	___	___	___	___	:Hostile
Interesting	___	___	___	___	___	___	___	___	:Boring
Successful	___	___	___	___	___	___	___	___	:Unsuccessful

IV

Now, this last section asks you to think about the following factors in connection with times you felt either satisfied or good, or dissatisfied or bad: (if you have felt both good and bad about the same factor, try to give an overall feeling for the majority of the time).

	Good	Bad
Achievement	____	____
Working Conditions	____	____
NWC Policy & Administration	____	____
Recognition	____	____
Work Itself	____	____
Responsibility	____	____
Supervision	____	____
Salary	____	____
Relations with Others	____	____
Advancement	____	____

Please do not go back and change any answers; you probably gave the best ones the first time through. Please place these sheets in the envelope provided and mail as soon as possible. Thank you!

APPENDIX H

Responses to Questionnaire

Section I: Most Preferred Co-Worker (MPC)

	8	7	6	5	4	3	2	1	
Pleasant	9	2	2	1					Unpleasant
Friendly	8	3	2	1					Unfriendly
Rejecting				1	1	3	2	7	Accepting
Helpful	6	6		2					Frustrating
Unenthusiastic					2	2	3	7	Enthusiastic
Tense					6	1	2	5	Relaxed
Distant	1		1	2	0	4	3	3	Close
Cold			1		5	2	2	4	Warm
Cooperative	7	5	2						Uncooperative
Supportive	6	3	4	1					Hostile
Boring					2	2	6	4	Interesting
Quarrelsome				1	1	3	1	8	Harmonious
Confident	5	3	4	2					Hesitant
Efficient	5	6	3						Inefficient
Gloomy					3	2	3	6	Cheerful
Open	5	2	3	2		1		1	Guarded

Section II: Least Preferred Co-Worker (LPC)

Pleasant				2	3	1	4	4	Unpleasant
Friendly		1	2	2	3	1	1	4	Unfriendly
Rejecting	3	4	2	5					Accepting
Helpful			1	1	2	1	1	8	Frustrating
Unenthusiastic	4	2	2	2	3				Enthusiastic

	8	7	6	5	4	3	2	1	
Tense	5	1	1	3	4				Relaxed
Distant	6	3	1	2	1	1			Close
Cold	7	3		3		1			Warm
Cooperative		1	1	1	4	3		4	Uncooperative
Supportive		2	1	1	3	1		6	Hostile
Boring	8	1	2	1	1		1		Interesting
Quarrelsome	5	1	2	3	2	1			Harmonious
Confident	2		2	1	3	1		5	Hesitant
Efficient			2	1	4		2	5	Inefficient
Gloomy	4	1	5	1	3				Cheerful
Open					4	1		8	Guarded

Section III: Group Atmosphere (GA)

Friendly	4	4	1	3	1	1			Unfriendly
Accepting	2	3	1	6	1		1		Rejecting
Satisfying	2	3	2	1	3	1		2	Frustrating
Enthusiastic	4	1	2	1	4			2	Unenthusiastic
Productive	5	3	3	2	1				Nonproductive
Warm	5	1	3	1	3			1	Cold
Cooperative	3	4	3	2	1		1		Uncooperative
Supportive	3	2	5	3				1	Hostile
Interesting	5	1	2	1	3			2	Boring
Successful	6	2	1	2	2		1		Unsuccessful

APPENDIX I

Questionnaire Analysis Using Fiedler's Scale Guide

Scale Item	MPC	LPC	DIFF	$(DIFF)^2$
Pleasant-Unpleasant	7.36	2.64	4.72	22.28
Friendly-Unfriendly	7.29	3.57	3.72	13.84
Rejecting-Accepting	2.07	6.36	4.29	18.40
Helpful-Frustrating	7.14	2.29	4.85	23.52
Unenthusiastic-Enthusiastic	1.64	5.71	4.07	16.57
Tense-Relaxed	2.57	6.00	3.43	11.77
Distant-Close	3.21	6.57	3.36	11.29
Cold-Warm	3.00	6.79	3.79	14.36
Cooperative-Uncooperative	7.36	3.36	4.00	16.00
Supportive-Hostile	6.64	3.29	3.35	11.22
Boring-Interesting	2.14	6.71	4.57	20.89
Quarrelsome-Harmonious	2.00	6.07	4.07	16.57
Confident-Hesitant	6.79	3.79	4.00	16.00
Efficient-Inefficient	7.14	3.00	4.14	17.14
Gloomy-Cheerful	2.14	6.14	4.00	16.00
Open-Guarded	6.14	2.50	3.64	13.25
Totals		74.79		259.10
$\overline{X}$ = Average LPC		4.67		
D = Square root of the sum of the $(DIFF)^2$				16.10

REQUISITIONS

PROCUREMENT PROGRESS & PLANNING RECORD NPOLA-4200-51 (REV 2-72)

A PROCUREMENT STEPS	SCHEDULE B-PLANNED	SCHEDULE C-REVISED PLAN	SCHEDULE D-ACHIEVED	E STATUS NOTES	BUYER NEGOTR HOURS WORKED F-TO DATE	BUYER NEGOTR HOURS WORKED G-NO HRS
1-REQUISITION RECEIVED IN NPOLA						
2-FIRM REQUISITION RECEIVED BY BUYER NEGOTIATOR						
3-PROCUREMENT PLAN PREPARED APPROVED	/	/	/			
4- ☐ D&F ☐ RAN ☐ APP AUTH _____ PREPARED APPROVED	/	/	/			
5-SYNOPSIS NOTICE ISSUED RESPONSE DUE	/	/	/			
6-MAILING LISTS ESTABLISHED NO OF SOURCES ____						
7- ☐ RFP ☐ IFB PREPARED						
8- ☐ RFP ☐ IFB ISSUED DUE	/	/	/			
9-NEGOTIATOR BUYER REVIEW OF QUOTES BIDS STARTED FINISHED	/	/	/			
10-TECH EVAL & RECOMMENDATION REQUESTED RECEIVED	/	/	/			
11-AUDIT REPORT REQUESTED RECEIVED	/	/	/			
12-PRE NEGOTIATION RB DOC OR BCL SUBMITTED APPROVED	/	/	/			
13-NEGOTIATIONS STARTED COMPLETED	/	/	/			
14-FINAL RB DOC OR BCL SUBMITTED APPROVED	/	/	/			
15-CONTRACT DOCUMENTATION DRAFTED FINAL APPROVAL	/	/	/			
16-AWARD RELEASED BY PURCHASING DIVISION						
17-AWARD RELEASED BY NPOLA						
18-RESPONSIVENESS STANDARD						
19-TIME STANDARD APPROVED						
20-T 20-TOTAL ELAPSED PROCESSING CALENDAR DAYS THRU ITEM 17						

21-ACTIVITY | 28-ESTD COSTS | 35-SCHEDULE NO.

22-REQN NO | 27-RCD BY B N | 36-P I I. NO

23-PROJECT | 30-DMR DATE | 37-B N CODE | 38-GS GRADE

24-PRIORITY | 31-AWARD RQD DMP | 32-MATRIX PTS GRAD | 33-ADJUST MENTS | 34-TOTAL PTS GRADE

25-FUND TYP | 32- | 42- | 43- | 44-

26-SECURITY REV | 33- | 45- | 46- | 47-

27-VAT NO | 34-TO BE POSTD | 48- | 49- | 50-

51-ITEM DESCRIPTION. (If Mod show nature of action & Mod No)

52-TYPE OF CONTRACT PLANNED · USED ·

53-TRANSFERRED TO DATE·

54-CANCELLED AUTH· DATE

AWARD INFORMATION

55-NO OFFERS RECEIVED 55A-NO : 55B-LOW $ 55C-HIGH $.

56-RECOMMENDED AWARD 56A-NO · 56B-$:

DATE OF AWARD

57A- ☐ LOW 57B- ☐ LOWEST RESPONS-QUAL 57C- ☐ BEST TECH QUAL

57D- ☐ OTHER (Explain below)

58-NAME OF CONTRACTOR

59-ADDRESS OF CONTRACTOR

60-SCHEDULE OF PERFORMANCE 60A-START: 60B-COMPLETE:

61 AUDIT REC'D ORAL WRITTEN FROM (ODAI) (DCAS) (DCAA)

62-FUNDING VIA THIS PROC ACTION	63-PREV COMMITMENTS FUNDED
62A-NOT RATED	63A-INITIAL INVMT $
62B-INITIAL INVMT $ COMMITTED	63B-OPTIONS $
62C-OPEN END $ COMMITTED	63C-OPEN END $
62D-OPTIONS PROVIDED	63D-
62E-GROSS $ THIS ACTION	63E-TOTALS
64-AWARD BY NEGOTIATION	65-

66 PURCHASE LABOR HOUR STANDARDS

APPENDIX K

Purchase Requests Collected During Four-Week Survey

Item Description	Value (000's)	Satisfies Algorithm? Yes	No
Fabrication & Test	$199.9		X
R&D Engineering Support	45.9		X
Support for A-6	479.0		X
Video Signal Processor	10.0	X	
Oscillator	2.9	X	
Steel	7.6	X	
Study(Unsolicited Proposal)	11.5	X	
Trailers	24.0	X	
Computer System	59.8		X
Reports on Studies	45.0		X
Mixer/Preamp	5.0	X	
Reports	65.0		X
Diode CW Oscillator	5.0	X	
Test Set	3.7	X	
Econdor	8.2	X	
Scanner	29.0	X	
Encoder	3.0	X	
Engine	4.5	X	
Cryostat	18.0	X	
Armor Plate	8.0	X	
Development & Production	112.0		X
Design & Fabrication	24.0		X
Feasibility Study	45.4		X
Tests	39.4		X
Frequency Agile Sub-System	35.0		X
Silvercells	24.4	X	
Doppler System	73.7	X	
Engineering Services	44.0		X
Replacement Parts	4.0	X	
Analyzer	3.9	X	
Level of Effort	28.0		X
Data	25.0		X
Design & Manufacture	125.0		X
Gas Generator	485.0		X
Inspect & Repair	150.0		X
Level of Effort	755.4		X
Connector	5.6	X	
Batteries	16.6	X	
Batteries	7.0	X	
Amplifier	3.8	X	
Receiver	29.0	X	
Transformer	3.5	X	
Optical Sensor Mount	60.0		X
Encoder	7.5	X	
Motor	12.0	X	
Report	23.5		X

Item Description	Value (000's)	Satisfies Algorithm? Yes	No
Support for A-7	400.0		X
Design Services	30.0		X
Heat/Cool Unit	5.7	X	
Microwave Radiometer	79.0		X
Container	25.0	___	X
		27	24

Exerpts from Captain R. H. Diggle & LCDR John R. Dolina Memorandum

a. Physically locate NWC Supply Department Contract Managers within the technical codes.

b. Expand the contract manager's charter to include procurement planning responsibilities.

c. Establish procedures for translating planning source documents (budget) into material requirements lists (shopping lists) so as to provide visible procurement status (status boards) to each Technical Department.

d. Establish procedures with NRPO-LA for establishing the credibility of vendor capability in the small dollar precurement arena....

e. Assign and fund additional billets (7) to NRPO-LA to handle the increased workload caused by the assignment of NWC procurements in the $2,500 to $25,000 range.

f. Establish a close personal liaison between NWC Contract Managers and NRPO-LA.

g. Expand the Requiring Activity Contract Administration program (RACA) to supplement DCAS personnel in those contracts where technical requirements are critical.

h. NWC Technical Director and Assistant Technical Director explore the possibility of ASN(R&D) approving class D&F's covering research projects being assigned to NWC to and including the forwarding of such D&F's with the weapon task papers to NWC for action.

i. NWC Supply Officer establish a formal review procedure for all procurement requirements being forwarded to NRPO-LA. This procedure should require the examination of all facets of a procurement package to ensure adequate justifications for exceptional procurement action, reasonable required delivery dates, etc. Levels of review should be established to require the approval of a total procurement package at a level no lower than the NWC Director of Procurement.

APPENDIX M

POSITION MANAGEMENT STUDY ON ASSIGNMENT OF PURCHASE REQUISITIONS
(PURCHASE ASSIGNMENT RECORD)
11ND-NRPOLA-4200 33 (REV. S-72)

PR OR SCHEDULE NO _____

☐ ORIGINAL ☐ REVISED

PURCHASE SECTION ASSIGNED	PRIORITY	DATE DELIVERY
	UMMIPS # _____ QRC/RDC # _____	DESIRED _____ REQUIRED _____

KIND OF REQUIREMENT							
R AND D	[1] RESEARCH	[2] EXPL. DEV.	[3] ADVANCE DEV	[5] CONTRACT DEF.	[6] ENGINEERING DEV.		
SUPPLY-EQUIPMENT			SERVICES			PRODUCTION	
☐ STANDARD	☐ CUSTOM	☐ TECHNICAL	☐ COMMERCIAL	☐ OPERATIONAL		☐ PILOT	☐ FOLLOW-ON

SPECIAL COMMENTS:

SECTION A - FORECAST OF THE LEVEL OF DIFFICULTY

					LEVEL OF DIFFICULTY
1. ESTIMATED DOLLAR VALUE	$ 0 - $ 250	100	$100,000 - $300,000	600	
	$ 250 - $ 2,500	200	$300,000 - $1 MILLION	700	
	$ 2,500 - $ 10,000	300	$1 MILLION - $5 MILLION	800	
	$10,000 - $ 50,000	400	$5 MILLION - $100 MILLION	1000	
	$50,000 - $100,000	500	$100 MILLION - AND UP	1200	

OTHER MAJOR DIFFICULT FACTORS BY LEVELS

LEVELS OF DIFFICULTY	NORMAL		ABOVE AVERAGE		EXTREMELY DIFFICULT		LEVEL OF DIFFICULTY
2. SPECIFICATIONS	STANDARD		SPECIALIZED		COMPLEX		
	COMMERCIAL BRAND NAME - COMMON SERVICES-FEDERAL-MILITARY SPECIFICATIONS.		BRAND NAME OR EQUAL-CUSTOMIZED-TECH. PARTS-ONE TIME BUYS-CONSOLIDATED-INDEFINITE QUANTITY		R&D-PRODUCTION-CONSTRUCTION-LEVEL OF EFFORT-PERFORMANCE GOALS-OPERATIONAL PERFORMANCE		
	PREVIOUSLY MADE SOLD TO SAME SPECIFICATIONS	0	NO PRECEDENCE	100	NO PRECEDENCE	200	
			PRECEDENT EXPERIENCE	50	PRECEDENT EXPERIENCE	100	
3. REASONABLENESS OF PRICE	COMPETITIVE		PRICE ANALYSIS		COST ANALYSIS		
	COMPETITIVE OR USE OF PUBLISHED PRICE LISTS	0	PREVAILING NEGOTIATOR	40	PREVAILING NEGOTIATOR	80	
			PREVAILING ESTIMATE		PREVAILING ESTIMATE		
4. TYPE OF ORDER OR CONTRACT	UNILATERAL ORDERS		BASIC CONTRACTS		SPECIAL TERMS		
	DELIVERY ORDERS UNDER INDEFINITE QUANTITY, DEDUCT POINTS FROM ESTIMATED $ VALUE SCALE WILL NOT EXCEED 300 WEIGHT WHICH IS	0	TWO PARTY CONTRACTS AND BASIC AGREEMENTS INCLUDING FIRM FIXED PRICE-COST NO FEE-COST PLUS FIXED FEE-TIME AND MATERIAL-LABOR HOUR-VARIOUS INDEFINITE QTY CONTRACTS & AGREEMENTS BILATERAL DOCUMENTS		SPECIAL TERMS AFFECT NO MAJOR ADJUSTMENTS FEES AND TOTAL COSTS SUCH AS PERFORMANCE COST DELIVERY INCENTIVES-PROTECTIVE MATERIAL-AWARD FEE-MAJOR ESCALATION-LETTER CONTRACTS-PARTIAL SETASIDE		
	TOTAL REDUCTION						
	PURCHASE ORDERS		TYPE PRIMARILY DETERMINED		TERMS PRIMARILY DETERMINED		
	UNILATERAL PURCHASE ORDERS UNDER $2,500	0	BY NEGOTIATOR	40	BY NEGOTIATOR	80	
	BILATERAL ORDERS						
	ORDERS AND JOB ORDERS UNDER BASIC ORDERING AGREEMENTS	0	BY OTHER PERSONNEL	20	BY OTHER PERSONNEL	40	
5. BARGAINING POWER	COMPETITIVE		LIMITED		SOLE SOURCE		
	REAL COMPETITIVE ENVIRONMENT EXISTS	0	LIMITED QUANTITY AVAILABILITY PAST PERFORMANCE		ONLY ONE SOURCE FEASIBLE OF PERFORMING	60	
6. MEET AND DEAL	SUPPLY PERSONNEL OR SALESMEN	0	PROJECT MANAGERS OR BRANCH MANAGERS	20	COMMANDING OFFICERS OR TOP EXECUTIVES	40	
7. CONTRACTUAL PERIOD	SIX MONTHS OR LESS	0	TWENTY-FOUR MONTHS OR LESS	20	OVER TWENTY-FOUR MONTHS	40	
8. METHOD OF PROCUREMENT	SMALL PURCHASES		FORMAL NEGOTIATIONS		FORMAL ADVERTISEMENT		
	BPA'S-IMPREST FUND PURCHASE DELIVERY ORDER	0	TWO PARTY CONTRACTS-APPLIED'S	10	FBIS PUBLIC OPENING-ACCEPTANCE OF BID	20	
9. KNOWLEDGE OF SOURCES	PASSIVE		COMPETITIVE		ACTIVE		
	SOLE SOURCE	0	KNOWN POTENTIAL SOURCES	10	SEARCH FOR SOURCES	20	
	LIMITED QUALIFIED	0					

10. FORECAST MADE BY _____ CODE _____ DATE _____ TOTAL WEIGHT FOR ALL LEVELS OF DIFFICULTY _____

MINIMUM WEIGHT PER GRADE-SKILL LEVEL

11. STANDARD LEVELS OF DIFFICULTY	100-190	200-390	400-490	500-590	600-790	800-990	1000-1190	1200-1590	1600 UP
	4	5	6	7	9	11	12	13	14

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1. REPORT NUMBER	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): Procurement Support at the Naval Weapons Center China Lake, California	5. TYPE OF REPORT & PERIOD COVERED: Master's Thesis; March 1974
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): Raymond J. Chalupsky	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Naval Postgraduate School, Monterey, California 93940	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: Naval Postgraduate School, Monterey, California 93940	12. REPORT DATE: March 1974
	13. NUMBER OF PAGES: 102
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office): Naval Postgraduate School, Monterey, California 93940	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

procurement
purchasing
Flexible Purchase Authority
support
Naval Weapons Center China Lake

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Research and Development is a unique process which seeks to develop the necessary technological base in order to provide the Navy with high quality weaponry in a timely manner at reasonable cost. An integral part of this process is the system of Navy Laboratories which pursue knowledge in a three-dimensional matrix of technologies, platforms and warfare areas. The method which supports this effort in obtaining the assistance of commercial entities may be impeding the efficiency of Navy Laboratories by requiring

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centralized procurement support for low-dollar requirements while procurement personnel in the laboratories are underutilized.

This thesis examines the procurement support system for the Naval Weapons Center China Lake, California, which is the largest Navy Laboratory. The principal focus is on the procurement lead times and the degree of skill utilization as perceived by the personnel at NWC.

A new approach to granting purchase authority is proposed which would recognize the uniqueness of the Research and Development process and the need to enrich procurement jobs through judicious delegation of purchase authority and responsibility.

Thesis
C339 Chalupsky
c.1 Procurement support at the Naval Weapons Center, China Lake, California.